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Subject: I-94 Access Options at Hawley Road

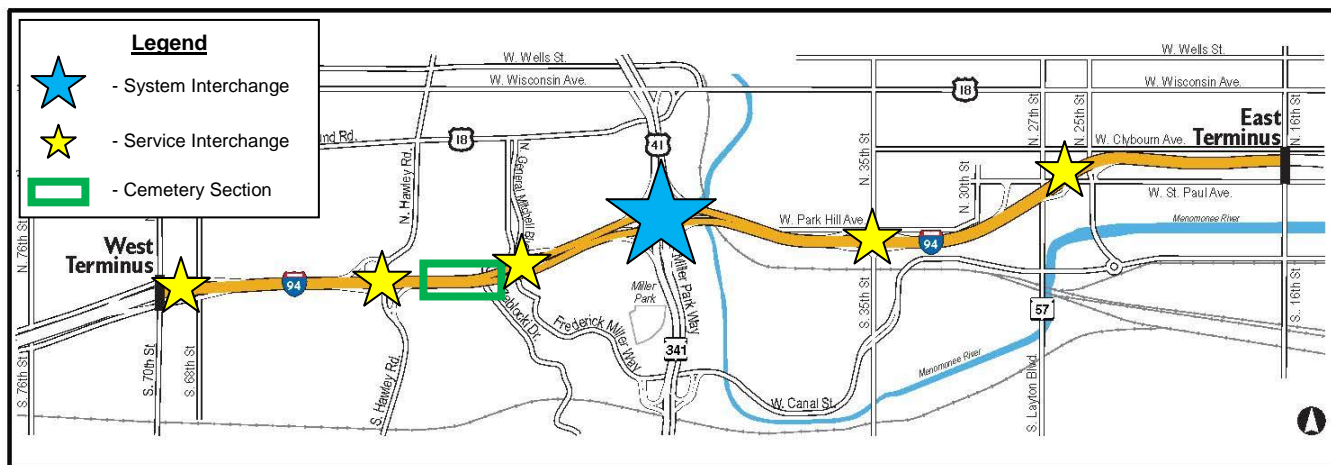
Date: May 20, 2014

1.0 EXECUTIVE SUMMARY

Overview

The Interstate 94 (I-94) Corridor study area is located in the City of Milwaukee, Wisconsin and includes three and one half miles of the I-94 freeway from approximately 70th Street (west terminus) to 16th Street (east terminus). This section of I-94 is one of the busiest in the southeast region and contains six closely spaced interchanges, as shown in **Figure 1** below. The purpose of the I-94 Corridor Study is to address deteriorated infrastructure, sub-standard geometrics, safety issues, and poor traffic operations that are characteristics of the existing freeway corridor.

Figure 1: I-94 Corridor Study Area



8LAG Alternative

The 8-Lane at Grade (8LAG) Alternative is one of two full corridor modernization alternatives developed by the study team to address the purpose and need for a reconstruction project. The design alternatives are complicated by numerous constraints, chief among them the location of the Wood National Cemetery and two Jewish cemeteries, which bound the existing I-94 corridor referred to as the “cemetery section”. Both the Wisconsin Department of Transportation (WisDOT) and the Federal Highway Administration (FHWA) have committed early on in the study to avoid impacts to the cemeteries with any design alternative.

Cemetery Section Constraint

At its narrowest point, there is approximately 110 feet of available width through the cemetery section of I-94 between Hawley Road and Mitchell Boulevard, considering the requirements of all geometric elements. Due to the horizontal alignment of I-94 through this area, six feet is needed in order to accommodate the roadway curvature, construction, and westbound (WB) outside barrier, which leaves approximately 104 feet of available width for the roadway cross-section.

WisDOT and American Association of State Highway and Transportation Officials (AASHTO) design standards specify 12-foot lanes and 12-foot shoulders for freeway reconstruction projects. However, the total cross-section width required by the use of standard lane and shoulder widths results in a total typical section width far greater than the 104 feet that is available. Therefore, the study team examined lane, median, and shoulder width combinations that utilized less than standard widths in order to fit a typical section through the cemetery section.

Cross-Section Selection

The study team developed a matrix of cross-section alternatives, which analyzed the geometric, safety, and traffic impacts associated with different lane, shoulder, and barrier widths in order to aid the determination of an optimal cross-section for the 8LAG Alternative through the cemetery section. Since the forecasted design year traffic demand for the corridor necessitated an additional freeway lane (four lanes in each direction), all six-lane cross-section alternatives were dropped from consideration.

Of the remaining cross-section alternatives with sub-standard lane and shoulder widths analyzed by the study team, one was chosen as the optimal configuration in order to maximize safety considerations and traffic operations through the cemetery section as part of the 8LAG Alternative. The optimal cross-section includes eight, 11-foot lanes (four in each direction), a two-foot eastbound (EB) outside shoulder, a slightly less than 4-foot WB outside shoulder, and a 10-foot median (including barrier spacing and widths), which results in a typical section that is slightly less than the 104-foot width available.

Hawley Road Interchange

As noted previously, one of the main characteristics of the 8LAG Alternative is the proposed addition of a fourth freeway lane in each direction. Operations through the cemetery section are further complicated by the locations of the Stadium Interchange and Hawley Road Interchange, which are adjacent to the cemetery section. As a result of the geometric constraints of the cemetery section and the proximity of the Hawley Road Interchange to the cemetery section (approximately two-tenths of a mile east), it was determined that the interchange could not be accommodated under the 8LAG Alternative.

The removal of the Hawley Road Interchange under the 8LAG Alternative has been shown at various stakeholder and agency meetings since its inception. However, the study team has found that the removal of freeway access at the Hawley Road Interchange is a contentious topic that has generated significant stakeholder opposition, which is discussed further in the following section.

As a result, the study team has been asked to re-examine various access scenarios at the Hawley Road Interchange under the 8LAG Alternative, which includes a “half diamond” service interchange to provide freeway access to and from the west only, and a full access service interchange. The “half interchange” alternative is also not without its issues, as FHWA policy requires full access at freeway service interchanges absent significant constraints or major impacts associated with the construction of a full interchange.

Access Scenarios

Three freeway access scenarios were analyzed for the Hawley Road Interchange in conjunction with the 8LAG Alternative, which are described in further detail below.

Full Access Scenario

The Full Access Scenario preserves full freeway access via a partial cloverleaf interchange on the west side of Hawley Road. Freeway access to the east and from the west would utilize loop ramps in the southwest and northwest quadrants, respectively. The I-94 EB exit and I-94 WB entrance ramps would be shifted outside of these loop ramps for full access. The ramps to and from the west would enter and exit the freeway via auxiliary lanes between Hawley Road and the 68th/70th Street Interchanges. The footprint to provide the partial cloverleaf loop ramps would introduce approximately 50 residential relocations.

It should be noted that the Full Access Scenario was eliminated from consideration early in the alternative development process due to the extensive level of impacts related to such a design. As a result of these impacts, WisDOT does not consider full access a reasonable or environmentally acceptable alternative for the Hawley Road Interchange under the 8LAG Alternative. However, this access scenario is retained as a comparative measure with the other remaining two access scenarios for the purposes of this memo.

While retaining full freeway access at Hawley Road has been generally supported by stakeholders and the general public, WisDOT and the study team has not shown a full access alternative at Hawley Road associated with the 8LAG Alternative.

Partial Access Scenario

The Partial Access Scenario provides I-94 access at Hawley Road to and from the west. The I-94 EB exit ramp would remain in a similar alignment as the existing configuration. The location of the north ramp terminal (I-94 WB entrance ramp) would be shifted south to create a more traditional diamond-style service interchange. Freeway access at Hawley Road under the Partial Access Scenario is eliminated to and from the east.

A partial freeway access alternative at Hawley Road under the 8LAG Alternative has not been shared with any project stakeholders to date.

No Access Scenario

The No Access Scenario completely removes freeway access at Hawley Road. Hawley Road would continue to pass under I-94 and be re-aligned slightly to the east to reduce the existing horizontal curvature. All vacated land previously utilized for the existing service ramps would be available for redevelopment, as the proposed alignment of I-94 would remain similar to the current alignment under the 8LAG Alternative.

As noted previously, the removal of freeway access at the Hawley Road Interchange has been shown to corridor stakeholders and the general public by WisDOT and the study team as a part of the 8LAG Alternative due to the constraints through the cemetery section. However, there has been significant opposition to the removal of freeway access from the local municipalities and corridor stakeholders. For example, one of the most visible corridor stakeholders, the Clement J. Zablocki Veterans Administration (VA) Medical Center, has written to WisDOT specifically to reference the magnitude of potential impacts to the VA Medical Center's employees (4,500+) and veterans (700,000 annual visits) due removal of freeway access at Hawley Road. Other stakeholders have indicated similar concerns regarding a lack of mobility and direct freeway access at Hawley Road.

Operations

The freeway mainline, service interchanges, and key local road intersections have been analyzed during the design year (2040) for all three access scenarios using the 2010 Highway Capacity Manual and Synchro, which have been summarized below.

Full Access Scenario

Local street operations under the Full Access Scenario operate better in comparison to the subsequent two access scenarios, as the traffic demand that would be forced to use the local streets and adjacent service interchanges can now fully utilize Hawley Road. As a result, there is a noticeable improvement in operations, as all key intersections range between level of service (LOS) C and LOS D, with only a few movements at LOS E or LOS F.

The freeway mainline operational range is similar to the other scenarios (operations range from LOS C to LOS E). However, the average operational speed of the freeway by direction is less than either the No Access or Partial Access Scenarios, as there are more turbulent segments included as part of the Full Access Scenario (ramps and weaves) that naturally introduce additional friction onto the freeway.

Partial Access Scenario

The Partial Access Scenario results in some significant impacts to the local street network, as only approximately one-third of the potential traffic demand at Hawley Road can utilize the "half interchange" to and from the west. However, these impacts have been minimized in comparison to the Full Access Scenario.

Design year mainline freeway operations for the Partial Access Scenario fall between LOS C and LOS E between 68th/70th Street and the Stadium Interchanges. Operations are generally improved in comparison to the Full Access Scenario, as there is less freeway access (and therefore less turbulence) associated with this access scenario. Key local intersections along Bluemound Road,

National Avenue, and Greenfield Avenue operate between LOS B and LOS D, with some turning movements operating at LOS E or LOS F.

No Access Scenario

Similar to the Partial Access Scenario, the No Access Scenario pushes a majority of traffic that would have previously utilized the Hawley Road Interchange to the local road network and the adjacent interchanges (68th/70th Street and the Stadium Interchange). As such, this access scenario exhibits the most extensive local road impacts of the three access scenarios.

Mainline freeway 2040 peak hour operations range between LOS C and LOS E between 68th/70th Street and the Stadium Interchanges. Similar to the Partial Access Scenario, local intersections operate between LOS B and LOS D, with some specific turning movements operating at LOS E or LOS F during either peak hour.

It should be noted that the design year forecasted volumes for all access scenarios includes some freeway diversion to the local street network that is directly related to the mainline capacity constraint on I-94 through the cemetery section. This traffic primarily diverts to parallel local routes to avoid delays on the freeway mainline in this area associated with the constraint. Poor freeway mainline operations (LOS E) reported across all access scenarios are at least partially related to the capacity constraint due to the narrower lane and shoulder widths discussed previously as part of the 8LAG Alternative design.

A comparison between the access scenarios of the number of freeway segments operating between LOS C and LOS F, in addition to the number of key intersection turning movements operating at LOS E and LOS F, is presented in **Table 1** below.

Table 1: Access Scenarios - LOS Comparison

Scenario	AM Peak Hour - LOS						PM Peak Hour - LOS					
	Number of Freeway Segments				Number of Int Turning Mvmts		Number of Freeway Segments				Number of Int Turning Mvmts	
	C	D	E	F	E	F	C	D	E	F	E	F
Full	2	10	0	0	3	1	2	9	1	0	2	0
Partial	2	6	0	0	3	2	2	5	1	0	5	0
No	4	4	0	0	7*	1*	4	3	1	0	7	1*

* - Includes a turning movement that has a volume/capacity ratio equal to or greater than 1.0

As shown in **Table 1** and summarized in the previous section, the Full Access Scenario operates with the least amount of unacceptable operations of the three access scenarios on the local street network. This is a direct result of the lowest degree of demand on the local street network with the additional freeway access provided at the Hawley Road Interchange. However, the consequence of the improved freeway access worsens traffic operations on I-94. Conversely, the No Access Scenario operates with the most number of unacceptable movements of the three access scenarios on the local street network, as there is inherently more demand on the parallel local roadways due to the loss of freeway access at the Hawley Road Interchange. However, the result is less demand on I-94 and better freeway operations in comparison to the Full Access Scenario.

The trade-off in operations between the local street network and freeway corridor is an important distinction between all three access scenarios.

Conclusion

This memo intends to provide documentation of impacts and operations of the various freeway access scenarios associated with the 8LAG Alternative at Hawley Road. The 8LAG Alternative is restricted through the cemetery section to four mainline lanes in each direction, with less than standard lane and shoulder widths to fit within the available ROW and avoid impacts to the adjacent cemeteries. All three access scenarios have some degree of impacts or issues associated with them, whether they are associated with the local street network or the freeway. In general, eliminating access entirely at Hawley Road has been deemed undesirable based on stakeholder feedback. However, additional consideration should be made in light of the impacts associated even with a partial access alternative.

Table 2 below shows a comparison of important characteristics for the consideration of each access scenario.

Table 2: Access Scenarios Comparison

Scenario	Characteristics				
	Freeway Access	ROW Impacts	Level of Service	Average Operating Speed (mph) ²	Hawley Rd Int Local/Adj Int Diversion
Full	To/from east and west	50 properties	LOS D-E ¹	N/A	0%
Partial	To/from west only	None	LOS D-E ¹	47	66%
No	None	None	LOS C-E ¹	51	100%

1 – Freeway capacity constraint through the cemetery section results in LOS E for all scenarios

2 – Average speeds reported based on Paramics results

As shown in **Table 2** above, the Full Access Scenario at Hawley Road provides full freeway access, which lessens the demand on adjacent service interchanges and the local street network. In addition, full freeway access has been supported by stakeholders. However, the full service interchange would not operate as well as the other two scenarios overall and has the most significant environmental impacts. In comparison, the No Access Scenario has had little public support, mainly due to the loss in direct freeway access at Hawley Road. However, the removal of the Hawley Road Interchange would possibly free up land for redevelopment or storm water retention. The Partial Access Scenario is similar in terms of impacts and the potential for available land. However, providing freeway access to and from the west only would still force approximately two-thirds of the design year demand at Hawley Road to divert to the local street network and adjacent service interchanges to access I-94.

Additionally, unfamiliar drivers that either wish to access I-94 EB from Hawley Road, or exit I-94 WB to Hawley Road, can be directed to adjacent access points at 68th/70th Street, the Stadium Interchange, or 44th/46th Street (“embedded interchange”) via local parallel arterials (Bluemound Road, Greenfield Avenue, and National Avenue) through the use of way-finding signs. The parallel arterials are located close enough to I-94 that utilizing these roadways is not a significant inconvenience in terms of re-routing. However, each roadway already carries a significant amount of traffic, and would be stressed further due to the diversion of freeway traffic.

As such, WisDOT and the study team would like to request approval from FHWA to study the Partial Access Scenario at Hawley Road in further detail. Additional analysis of the Partial Access Scenario will help WisDOT and the project team show stakeholders and the general public that all feasible options for Hawley Road under the 8LAG Alternative have been thoroughly investigated.

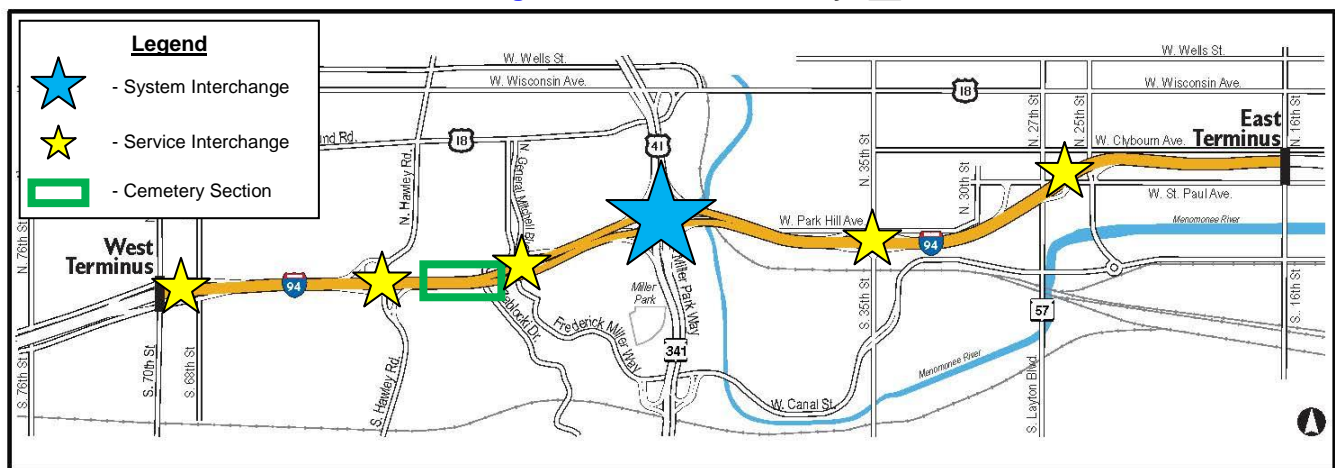
While the technical merits of the Partial Access Scenario may not significantly outweigh the potential issues, WisDOT and the study team feel that retaining a partial access design at Hawley Road could help to address significant stakeholder concerns regarding freeway access removal. At the very least, the Partial Access Scenario could represent a possible compromise for all parties that satisfy a degree of stakeholder mobility and access concerns, while still avoiding impacts through the cemetery section and lessening the volume/operational impacts to adjacent interchanges and the local street network to the greatest extent possible under the 8LAG Alternative.

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2.0 OVERVIEW

The I-94 Corridor Study area is located in the City of Milwaukee, Wisconsin and includes three and one half miles of the I-94 freeway from approximately 70th Street (west terminus) to 16th Street (east terminus). Bounded by the Marquette Interchange (east) and the Zoo Interchange (west), this section of I-94 is one of the busiest freeway routes in southeast Wisconsin. The I-94 Corridor study area contains six service interchanges, including one system interchange, five of which are located along I-94, as shown in **Figure 2** below. The system interchange (also referred to as the Stadium Interchange) provides access between I-94, United States Highway 41 (US 41) north of I-94, and Wisconsin State Highway 341 (WIS 341) south of I-94.

Figure 2: I-94 Corridor Study Area



8LAG Alternative

The purpose of the I-94 Corridor Study is to address the deteriorated condition, sub-standard geometrics, high crash rates, and (existing and future) operational issues that are inherent to the existing freeway corridor through a modernized corridor design alternative. Currently, the study team has narrowed the range of alternatives down to two full corridor alternatives. One of the most significant differences between the two alternatives is through the “cemetery section”, located between Hawley Road and Mitchell Boulevard on the west leg of the corridor. This section of I-94 runs through a National Historic Landmark (Wood National Cemetery), which is located on both sides of the roadway and as such, WisDOT and FHWA have committed to avoiding impacts to the cemetery.

Alternative 1, also known as the “8 Lane at Grade” (8LAG) Alternative, provides four lanes in each direction on I-94 through the cemetery section, which utilizes the full extent of available right-of-way (ROW) and reduces lane and shoulder widths in order to avoid impacts to graves. The development of the optimal cross-section through the cemetery section is described further in the following sections.

Cemetery Section Constraint

At its narrowest point, there is approximately 110 feet of available width through the cemetery section of I-94 between Hawley Road and Mitchell Boulevard, considering the requirements of all geometric elements. Due to the horizontal alignment of I-94 through this area, six feet is needed in order to accommodate the roadway curvature, construction, and WB outside barrier, which leaves approximately 104 feet of available width for the roadway cross-section.

WisDOT and AASHTO design standards specify 12-foot lanes and 12-foot shoulders for freeway reconstruction projects. However, the total cross-section width required by the use of standard lane and shoulder widths results in a total typical section width far greater than the 104 feet that is available. Therefore, the study team examined lane, median, and shoulder width combinations that utilized less than standard widths in order to fit a typical section through the cemetery section.

Cross-Section Selection

The study team developed a matrix of cross-section alternatives, which analyzed the geometric, safety, and traffic impacts associated with different lane, shoulder, and barrier widths in order to aid the determination of an optimal cross-section for the 8LAG Alternative through the cemetery section. Since the forecasted design year traffic demand for the corridor necessitated an additional freeway lane (four lanes in each direction), all six-lane cross-section alternatives were dropped from consideration.

Of the remaining cross-section alternatives with sub-standard lane and shoulder widths analyzed by the study team, one was chosen as the optimal configuration in order to maximize safety considerations and traffic operations through the cemetery section as part of the 8LAG Alternative. The optimal cross-section includes eight, 11-foot lanes (four in each direction), a two-foot EB outside shoulder, a slightly less than 4-foot WB outside shoulder, and a 10-foot median (including barrier spacing and widths), which results in a typical section that is slightly less than the 104-foot width available.

Hawley Road Interchange

As noted previously, one of the main characteristics of the 8LAG Alternative is the proposed addition of a fourth freeway lane in each direction. Operations through the cemetery section are further complicated by the locations of the Stadium Interchange and Hawley Road Interchange, which are adjacent to the cemetery section. As a result of the geometric constraints of the cemetery section and the proximity of the Hawley Road Interchange to the cemetery section (approximately two-tenths of a mile east), it was determined that the interchange could not be accommodated under the 8LAG Alternative.

The removal of the Hawley Road Interchange under the 8LAG Alternative has been shown at various stakeholder and agency meetings since its inception. However, the study team has found that the removal of freeway access at the Hawley Road Interchange is a contentious topic that has generated significant stakeholder opposition, which is discussed further in [Section 5](#).

As a result, the study team has re-examined various access options at Hawley Road under the 8LAG Alternative, which among other designs includes a “half interchange” (i.e. access is provided to/from one freeway direction). It should be noted that FHWA states that “each interchange shall provide for all traffic movements” as part of the American Association of State Highway and Transportation Officials’ *A Design Policy on Design Standards - Interstate System (5th Edition)*.

Despite this standard, it is the study team's intent to investigate all reasonable alternatives for this interchange, including a partial access interchange that would provide freeway access to and from the west in combination with the 8LAG Alternative, for the following reasons:

- Providing full access at Hawley Road (under the 8LAG Alternative) is highly impactful
- Hawley Road service ramps to and from the west are currently and will remain higher volume ramps
- Traffic to and from the east can be served via the local road network and adjacent interchanges (assuming local road improvements are implemented to adequately handle future demand)

Discussion of these and other points are included in further detail in this memo, which documents the impacts and operations of three access scenarios (full, partial, and no) on the Hawley Road, 68th/70th Street, and Stadium Interchanges, in addition to the key intersections located on the local street network that are impacted under each scenario. Additional discussion is included regarding the usage and travel patterns of the Hawley Road Interchange.

Traffic Analysis

Design year (2040) demands for all three access scenarios have been developed based on forecasts received by the study team from the Southeast Wisconsin Regional Planning Commission (SEWRPC). These forecasts include the capacity expansion of I-94 to four lanes in each direction, in addition to the capacity constraint of the cemetery section, which is related to the less than standard lane and shoulder widths included as part of the 8LAG Alternative.

The proposed service interchange and local road intersection designs for each access scenario have been analyzed using Synchro and results reported based on HCM 2010 signalized intersection methodology. The I-94 freeway mainline has been analyzed for each access scenario using HCM 2010 freeway methodology for basic, ramp, and weave segments.

It is the intent of this memo to provide documentation of the access scenarios considered and analyzed for the Hawley Road Interchange, as part of the 8LAG Alternative, to date and request the approval of further study of the Partial Access Scenario at Hawley Road from FHWA.

3.0 FULL ACCESS SCENARIO

Description

The Full Access Scenario provides full freeway access at Hawley Road via a partial cloverleaf interchange on the west side of the roadway. Freeway access to the east and from the west would utilize loop ramps in the southwest and northwest quadrants, respectively. The I-94 EB exit and I-94 WB entrance ramps would be shifted outside of the loop ramps to provide the remaining freeway access. The ROW impacts related to this scenario are extensive, as the footprint to provide the Full Access Scenario would introduce approximately 50 residential relocations.

As mentioned previously, the Full Access Scenario has been eliminated from consideration by the study team mainly due to the significant environmental impacts associated with the design. However, it has been retained for the purposes of this memo to use as a baseline comparison against the previous two access scenarios. [Appendix A](#) includes a plan view of the proposed Full Access Scenario at the Hawley Road Interchange.

Access

There are numerous geometric issues with providing full freeway access at the Hawley Road Interchange under the Full Access Scenario. These issues include taper rates and weave distances, among other design characteristics. The I-94 WB exit ramp taper is at or slightly less than standard for deceleration distance requiring vehicles to slow down significantly on the mainline in advance of the exit ramp, which adds additional congestion and turbulence on the mainline. Additionally, since the I-94 EB exit and I-94 WB entrance ramps are shifted to the outside of the loop ramps, the available weave distance west to the 68th/70th Street Interchange service ramps to/from the east is reduced to approximately 600 feet, which is less than the desirable weave distance (1,600 feet). This issue could possibly be mitigated by braiding the ramps. However, it would introduce additional design complexity, environmental impacts including noise, and increased project costs.

While retaining full freeway access at Hawley Road has been generally supported by corridor stakeholders and the general public, WisDOT and the study team has not shown a full access alternative at Hawley Road associated with the 8LAG Alternative.

Operations

The following local road intersections have been analyzed in further detail due to the forecasted demand that occurs along these roadways as part of the Full Access Scenario. Impacts to the adjacent interchanges at 68th/70th Street and the Stadium are detailed further in [Section 7](#).

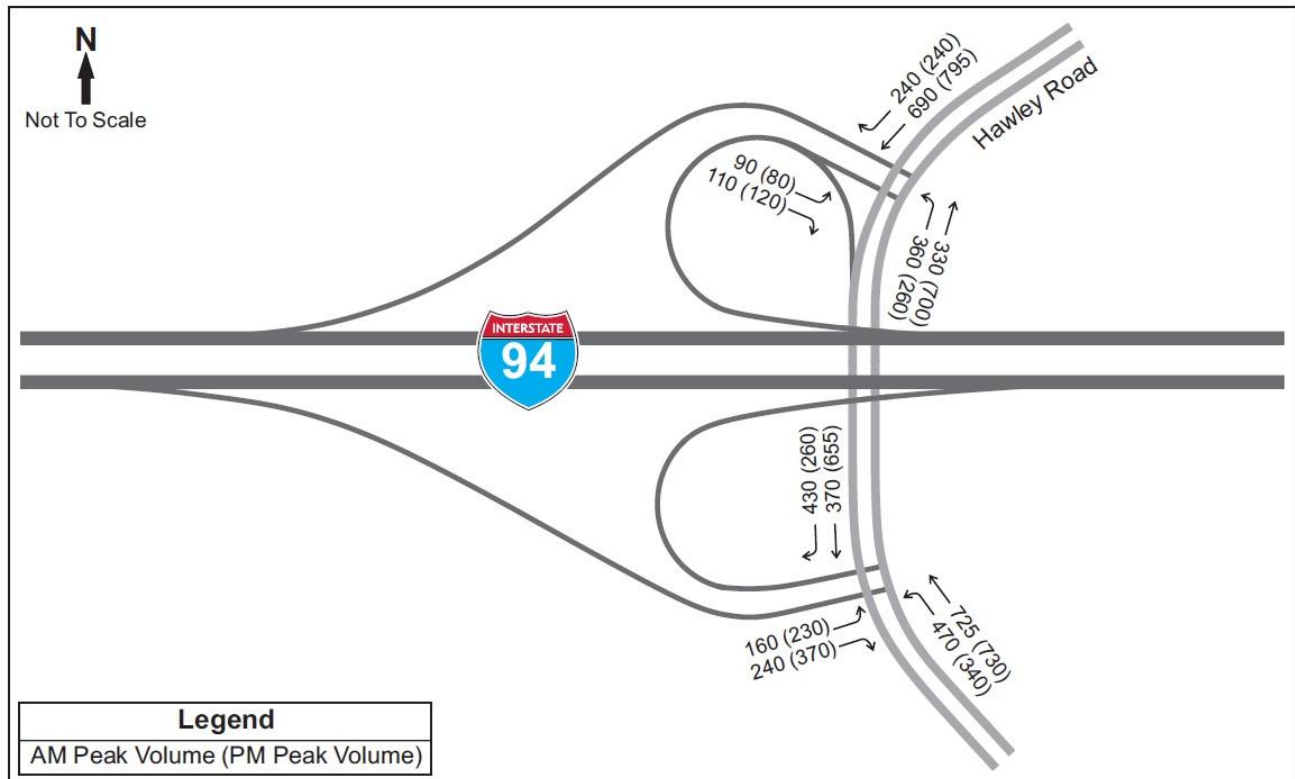
- Bluemound Road and Hawley Road
- Bluemound Road and 68th Street
- National Avenue and WIS 341 (Miller Park Way)
- National Avenue and Hawley Road
- National Avenue and Greenfield Avenue
- Greenfield Avenue and 70th Street

[Appendix B](#) shows the locations of the analyzed local road intersections in conjunction with the service and system interchanges on the west leg of the study area for reference.

These intersections have been chosen due to their proximity to the Stadium and 68th/70th Street Interchanges, in addition to their functions as major connection points between these service interchanges and major local street parallel routes (Bluemound Road, Greenfield Avenue, and National Avenue). Impacts to the local street network and adjacent service interchanges are mainly limited to the west leg of the study area under the Full Access Scenario.

Design year 2040 peak hour traffic forecasts for the Full Access Scenario at the Hawley Road Interchange are shown in **Figure 3** below.

Figure 3: Full Access Scenario - Year 2040 Peak Hour Forecast at Hawley Road



As noted previously, several local road intersections were analyzed to determine impacts associated with the Full Access Scenario for the Hawley Road Interchange. The proposed local street intersection geometries to accommodate demand and provide minimally acceptable operations (overall intersection LOS D) as part of this scenario are shown in **Table 3** on the following page, with the proposed geometric improvements for each intersection highlighted in orange. The design year peak hour local street volumes were developed based on SEWRPC's design year daily forecast of the corridor associated with the Full Access Scenario.

As there is no additional access-based diversion assumed at these intersections as part of the Full Access Scenario, any recommended changes in geometry can be considered as "base" improvements for the design year demands. It should be noted that none of these intersections are under WisDOT jurisdiction and as such, any recommendations are subject to change based on feedback from the WisDOT Southeast (SE) Region and local municipalities.

Table 3: Full Access Scenario - Proposed Geometry for Local Road Intersections

Intersection	Traffic Control	Number of Lanes per Movement Approach											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Bluemound Road and Hawley Road	Traffic Signal	1	2	1	1	1 T, 1 T/R		1	1 T, 1 T/R		1	2	1
Bluemound Road and 68th Street	Traffic Signal	1	1 T, 1 T/R		1	1 T, 1 T/R		1	1 T, 1 T/R		1	1 T, 1 T/R	
National Avenue and WIS 341 (MPW)	Traffic Signal	2	1 T, 1 T/R		1	2	1	1	3	1	1	3	2
National Avenue and Hawley Road	Traffic Signal	1	1 T/R		1	1 T, 1 T/R		1 L/T, 1 T/R			1 L/T, 1 T/R		
National Avenue and Greenfield Avenue	Traffic Signal	1	1 T/R		1	1 T/R		1 L/T, 1 T/R			1 L/T		1
Greenfield Avenue and 70th Street	Traffic Signal	1 L/T, 1 T/R			1	1 T, 1 T/R		1	2	1	1	1 T, 1 T/R	

As shown in **Table 3** above, the majority of the proposed intersection improvements are capacity-related, where an additional through lane is needed to provide minimally acceptable operations. Most, if not all, of the capacity-related improvements shown can be achieved with minimal ROW impacts by stripping a curb/parking lane and utilizing it as a travel lane. Intersection improvements beyond repurposing the curb/parking lane are limited at these local intersections due to the developed, urban nature of the study area, where businesses and residences are typically located immediately adjacent to roadways.

The proposed Hawley Road Interchange lane configuration for the north (I-94 WB ramps) ramp terminal is similar to the existing configuration. Hawley Road would remain as a four-lane facility with an exclusive, single northbound left (NBL) turn lane at the north ramp terminal. The WB exit loop ramp would provide a single westbound left (WBL) turn lane, which would be controlled by the north ramp terminal traffic signal, and a yield-controlled westbound right (WBR) turn lane.

The south ramp terminal (I-94 EB ramps) would shift south of the existing I-94 EB exit ramp terminal on Hawley Road to accommodate the I-94 EB entrance loop ramp. The I-94 EB exit ramp would provide exclusive eastbound left (EBL) and eastbound right (EBR) turn lanes at the intersection approach. In addition, a single NBL turn lane would be provided to access the I-94 EB entrance ramp from the south. It should be noted that the analysis of the proposed south ramp terminal assumes the installation of a traffic signal. However, a traffic signal warrant analysis has not yet been completed.

Table 4 on the following page shows the design year peak hour operations for the Full Access Scenario at the Hawley Road Interchange and selected local road intersections.

Table 4: Full Access Scenario - Design Year LOS for Hawley Road and Local Road Intersections

Intersection	Peak Hour	Level of Service (LOS) by Movement												Overall Int LOS
		Eastbound			Westbound			Northbound			Southbound			
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Bluemound Road and Hawley Road	AM	B	C	B	B	C		B	B		B	B	B	B
	PM	B	C	C	B	C		B	B		C	C	C	C
Bluemound Road and 68th Street	AM	B		A	D		D	C		C	B		C	C
	PM	C		B	C		D	C		C	B		A	C
National Avenue and WIS 341 (MPW)	AM	E		D	E	E	B	D	D	A	F	D	B	D
	PM	D		D	E	D	D	E	C	A	D	C	A	D
National Avenue and 60th Street (Hawley Road)	AM	B		C	D		C		B			B		B
	PM	C		C	C		C		A			D		C
National Avenue and Greenfield Avenue	AM	C		B	C		C		B			B	A	C
	PM	D		C	D		C		C			C	A	C
Greenfield Avenue and 70th Street	AM			A	B		C	B	B	A	C		B	B
	PM			C	C		D	D	C	A	C		C	C
Hawley Road and I-94 WB Entrance Ramp	AM	B	-	A	-	-	-	B	A	-	-	B	A	A
	PM	C	-	A	-	-	-	B	A	-	-	B	A	A
Hawley Road and I-94 EB Exit Ramp	AM	C	-	B	-	-	-	A	A	-	-	B	A	A
	PM	C	-	C	-	-	-	A	A	-	-	B	A	B

As shown in **Table 4** above, the majority of intersections analyzed operate at acceptable levels of service (LOS D or better) overall during both design year peak hours under the Full Access Scenario. In fact, only one intersection (National Avenue and WIS 341) has turning movements to operate at LOS E or LOS F. The lack of poor and failing movements at other intersections analyzed is at least partially related to the full access provided at Hawley Road. Traffic demand that under subsequent scenarios (Partial Access and No Access) is forced to adjacent interchanges or local parallel routes is provided more direct freeway access as part of the Full Access Scenario, which results in less traffic on the local street network by comparison.

The intersection of National Avenue and WIS 341 (Miller Park Way) is located in a very constrained area. The northeast, southeast, and southwest quadrants are fully developed with commercial and industrial businesses that are located extremely close to the intersection. In addition, the northwest quadrant of the intersection is part of a National Historical Landmark, which complicates any potential ROW acquisition for intersection improvements. As a result, geometric improvements on all four approaches are mainly limited to short storage lane lengthening, rather than capacity improvements (additional turn and through lanes), as shown in **Table 3**.

Consequently, the intersection provides minimal to poor operations during the design year peak hours under baseline growth conditions. This issue is further complicated by additional diversion that utilizes this intersection under the Partial Access and No Access Scenarios (discussed in the following sections), as traffic attempts to bypass I-94 mainline congestion through the cemetery section via the local street network.

4.0 PARTIAL ACCESS SCENARIO

Description

The Hawley Road Interchange under the Partial Access Scenario would maintain I-94 access to and from the west. The I-94 EB exit ramp terminal would be close to the existing location of the south ramp terminal. The I-94 WB entrance ramp terminal, north of I-94, would be shifted slightly south to tighten the footprint, taking advantage of the elimination of the I-94 WB exit loop ramp and provide a more traditional diamond configuration for the ramps to and from the west.

As a result, some ROW would be freed up by the Partial Access Scenario in the northwest quadrant, which is currently occupied by the existing I-94 WB entrance and exit ramp configuration, and may be allocated for redevelopment. [Appendix A](#) includes a plan view of the proposed Partial Access Scenario at the Hawley Road Interchange.

Access

Direct freeway access to and from the east would be re-routed via the local street network. This traffic could use either Bluemound Road or Greenfield Avenue to access I-94 at either the 68th/70th Street Interchange (approximately one half mile west of Hawley Road) or the Stadium Interchange (approximately one mile east of Hawley Road).

Due to the proximity of the cemeteries to Hawley Road, there is no feasible option for replacing the existing I-94 EB entrance ramp from the east side of Hawley Road without impacting the cemeteries. In addition to the added mainline capacity of the 8LAG Alternative (four lanes in each direction), this means that the mainline footprint through the cemetery section cannot accommodate any acceptable acceleration, deceleration, or taper distances for service ramps.

It should be noted that a partial freeway access alternative at Hawley Road under the 8LAG Alternative has not been shared with any project stakeholders to date.

Operations

Design year (2040) peak hour traffic operations of the previously listed key local road intersections were analyzed in further detail due to the forecasted diversion that occurs at these locations as part of the Partial Access Scenario. Impacts to the local street network and adjacent service interchanges at 68th/70th Street and the Stadium Interchange are slightly more extensive on the west leg as compared to the Full Access Scenario. Analysis of the adjacent service interchanges is discussed further in [Section 7](#).

[Appendix B](#) shows the locations of the analyzed local road intersections in conjunction with the service and system interchanges on the west leg of the study area for reference.

[Figure 4](#) on the following page shows the design year peak hour volumes for the Hawley Road Interchange under the Partial Access Scenario.

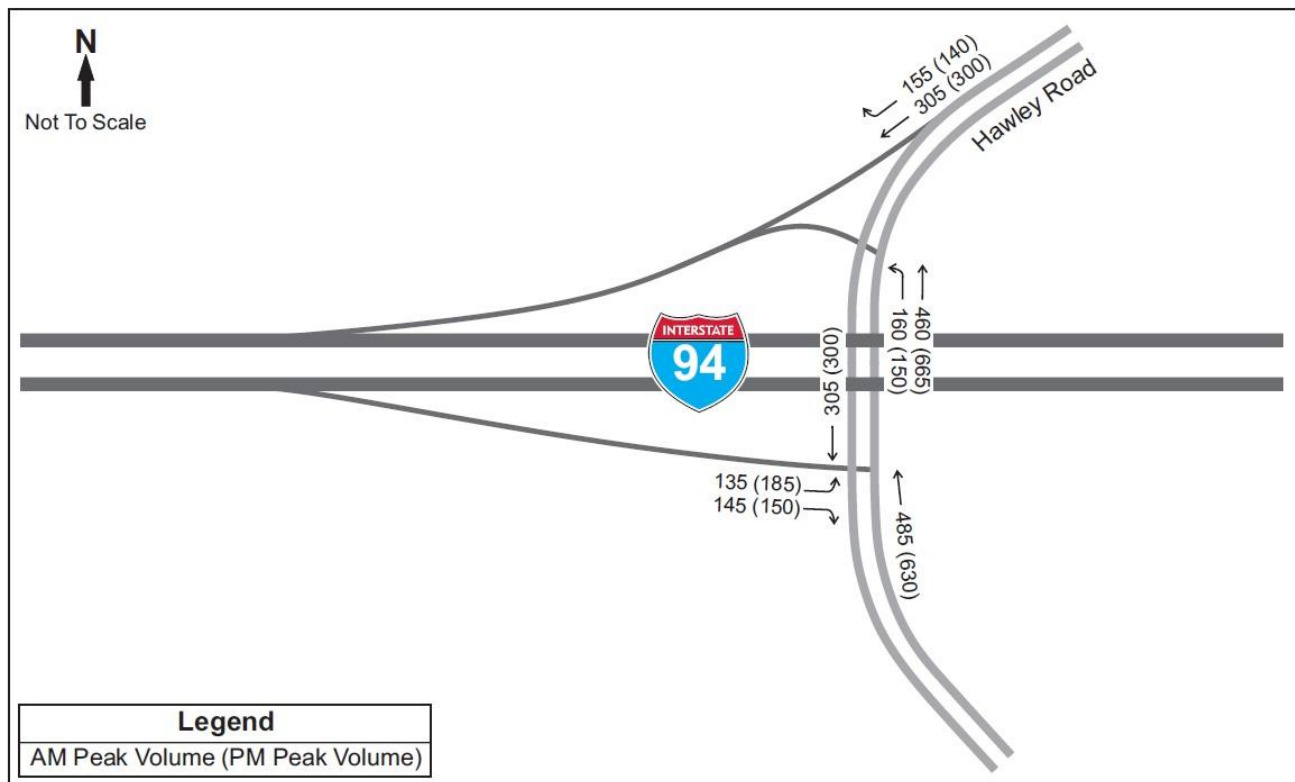
Figure 4: Partial Access Scenario - Year 2040 Peak Hour Forecast at Hawley Road

Table 5 below shows the proposed intersection lane configurations and design year traffic operations for the selected local road intersections, including the Hawley Road Interchange ramp terminals. The proposed geometric changes for each intersection, highlighted in orange in **Table 5**, are designed to provide minimally acceptable operations (overall intersection LOS D) based on the forecasted local street demand associated with the Partial Access Scenario. Again, it should be noted that none of these intersections are under WisDOT jurisdiction and as such, any recommendations will be coordinated with the WisDOT SE Region and local municipalities.

Table 5: Partial Access Scenario - Proposed Geometry for Local Road Intersections

Intersection	Traffic Control	Number of Lanes per Movement Approach											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Bluemound Road and Hawley Road	Traffic Signal	1	2	1	1	1 T, 1 T/R		1	1 T, 1 T/R		1	2	1
Bluemound Road and 68th Street	Traffic Signal	1	1 T, 1 T/R		1	1 T, 1 T/R		1	1 T, 1 T/R		1	1 T, 1 T/R	
National Avenue and WIS 341 (MPW)	Traffic Signal	2	1 T, 1 T/R		1	2	1	1	3	1	1	3	2
National Avenue and Hawley Road	Traffic Signal	1	1 T, 1 T/R		1	1 T, 1 T/R		1 L/T, 1 T/R			1 L/T, 1 T		1
National Avenue and Greenfield Avenue	Traffic Signal	1	1 T/R		1	1 T/R		1 L/T, 1 T/R			1 L/T		1
Greenfield Avenue and 70th Street	Traffic Signal	1 L/T, 1 T/R			1	1 T, 1 T/R		1	2	1	1	1 T, 1 T/R	

Similar to the Full Access Scenario, the intersection improvements proposed in [Table 5](#) are capacity-related, as an additional through lane is needed to provide minimally acceptable operations. Again, most of these improvements can be implemented with the repurposing of curb/parking lanes as travel lanes. It should be noted that the number and degree of improvements is more extensive, as compared to the Full Access Scenario, as traffic that previously was able to access Hawley Road via I-94 to and from the east is now diverted to the local street network and adjacent interchanges. The local road diversion as part of the Partial Access Scenario necessitates additional improvements in order to provide acceptable operations on the local street network.

The proposed lane configurations for the north (I-94 WB entrance ramp) and south (I-94 EB exit ramp) Hawley Road Interchange ramp terminals are similar to the existing configuration. Hawley Road would remain as a four-lane facility with a single NBL turn lane at the north ramp terminal. The EB approach at the south ramp terminal would provide exclusive EBL and EBR turn lanes. It should be noted that the analysis assumes the installation of a traffic signal for the south ramp terminal. However, a traffic signal warrant analysis has not yet been completed.

[Table 6](#) below shows the design year peak hour operations for the Partial Access Scenario at the Hawley Road Interchange ramp terminals and selected local road intersections.

Table 6: Partial Access Scenario - Design Year LOS for Hawley Road and Local Road Intersections

Intersection	Peak Hour	Level of Service (LOS) by Movement												Overall Int LOS
		Eastbound			Westbound			Northbound			Southbound			
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Bluemound Road and Hawley Road	AM	B	C	B	C		D	C		C	C	B	B	C
	PM	C	C	C	B		D	C		B	B	B	B	C
Bluemound Road and 68th Street	AM	C	E		F		C	D		C	B		B	D
	PM	E		D	C		D	C		C	C	A		C
National Avenue and WIS 341 (MPW)	AM	D		C	E	E	D	D	D	A	F	D	B	D
	PM	D		C	E		D	E	D	A	D	C	A	D
National Avenue and 60th Street (Hawley Road)	AM	C		B	C		B		A		B		B	B
	PM	C		B	B		B		B		C		B	B
National Avenue and Greenfield Avenue	AM	C		C	C		D		C		B		B	C
	PM	E		D	E		D		C		D		C	D
Greenfield Avenue and 70th Street	AM		B		B		C	C	C	A	C		B	B
	PM		C		B		C	C	C	A	B		C	C
Hawley Road and I-94 WB Entrance Ramp	AM	-	-	-	-	-	-	A	A	-	-	A	A	A
	PM	-	-	-	-	-	-	A	A	-	-	A	A	A
Hawley Road and I-94 EB Exit Ramp	AM	A	-	A	-	-	-	-	A	-	-	A	-	A
	PM	B	-	B	-	-	-	-	A	-	-	A	-	A

As shown in [Table 6](#) above, overall intersection operations are similar to the Full Access Scenario, where all intersections operate at LOS D or better. However, the additional demand on Bluemound Road and Greenfield Avenue, due to the utilization of these roadways as local access routes as part of the restriction of freeway access at Hawley Road, results in an increase in poor (LOS E) and failing (LOS F) turning movement operations at the intersections with 68th Street (Bluemound Road) and National Avenue (Greenfield Avenue).

Additional turn or through lanes at the intersection of Bluemound Road and 68th Street, beyond the proposed expansion of 68th Street to a four-lane facility, to improve turning movement LOS are unfeasible due to the proximity of residences in all four quadrants. Similarly, the intersection of Greenfield Avenue and National Avenue cannot be improved beyond what is proposed in [Table 6](#), as there are several businesses located against the back of sidewalk along both roadways. Operations at this intersection are further complicated by the skew of the intersection and north-south one-way street (62nd Street) that forms the north and south legs, which limits potential geometric and signal phasing improvements.

Similar to the Full Access Scenario, the intersection of National Avenue and WIS 341 (Miller Park Way) continues to be a critical intersection in terms of access-based diversion operations. As noted previously, this intersection is located in a very constrained environment and as a result, ideal capacity-related improvements are unfeasible.

DRAFT

5.0 NO ACCESS SCENARIO

Description

The No Access Scenario at the Hawley Road Interchange would maintain the four-lane geometry of Hawley Road while removing the existing interchange connections to I-94. The land that is currently utilized for interstate access would potentially become available for redevelopment. Additionally, Hawley Road would be slightly re-aligned to the east under I-94 to reduce the existing horizontal curvature of the roadway. [Appendix A](#) includes a plan view of the proposed Hawley Road alignment under the No Access Scenario.

Access

Direct freeway access would be completely eliminated to/from Hawley Road under the No Access Scenario, as noted previously. Traffic on Hawley Road that wishes to access I-94 would be forced to use either Bluemound Road or Greenfield Avenue, parallel arterials to I-94, to access the freeway at either the 68th/70th Street Interchange or the Stadium Interchange.

It should be noted that the removal of freeway access at the Hawley Road Interchange has been shown to corridor stakeholders and the general public by WisDOT and the study team as part of the 8LAG Alternative due to the constraints through the cemetery section. However, there has been significant opposition to the removal of freeway access from local officials and stakeholders. In fact, one of the most visible project stakeholders, the Clement J. Zablocki Veterans Administration (VA) Medical Center, has written to WisDOT concerning the importance of the Hawley Road Interchange to their employees (4,500+) and visitors (700,000 annually). Other project stakeholders have shared similar concerns regarding a lack of mobility and direct freeway access at Hawley Road.

Operations

Design year (2040) peak hour traffic operations of the previously listed key local road intersections were analyzed in further detail due to the forecasted diversion that occurs at these locations as part of the No Access Scenario. Impacts to the local street network and adjacent service interchanges at 68th/70th Street and the Stadium Interchange are more extensive on the west leg as compared to the Partial Access Scenario. Analysis of the adjacent service interchanges is discussed further in [Section 7](#).

[Appendix B](#) shows the locations of the analyzed local road intersections in conjunction with the service and system interchanges on the west leg of the study area for reference.

[Tables 7 and 8](#) on the following page show the proposed intersection improvements and design year traffic operations for these locations, respectively. The proposed geometric changes for each intersection, highlighted in orange in [Table 7](#), have been developed to provide minimally acceptable operations (overall intersection LOS D) based on the forecasted local street demand associated with the No Access Scenario. The design year peak hour local street volumes were developed based on SEWRPC's design year daily forecast of the corridor associated with the No Access Scenario.

It should be noted that none of these intersections are under WisDOT jurisdiction and as such, any recommendations are subject to change based on feedback from the WisDOT SE Region and local municipalities.

Table 7: No Access Scenario - Proposed Geometry for Local Road Intersections

Intersection	Traffic Control	Number of Lanes per Movement Approach											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Bluemound Road and Hawley Road	Traffic Signal	1	2	1	1	1 T, 1 T/R		1	1 T, 1 T/R		1	2	1
Bluemound Road and 68th Street	Traffic Signal	1	1 T, 1 T/R		1	1 T, 1 T/R		1	1 T, 1 T/R		1	1 T, 1 T/R	
National Avenue and WIS 341 (MPW)	Traffic Signal	2	1 T, 1 T/R		1	2	1	1	3	1	1	3	2
National Avenue and Hawley Road	Traffic Signal	1	1 T, 1 T/R		1	1 T, 1 T/R		1 L/T, 1 T/R			1 L/T, 1 T		1
National Avenue and Greenfield Avenue	Traffic Signal	1	1 T/R		1	1 T/R		1 L/T, 1 T/R			1 L/T		1
Greenfield Avenue and 70th Street	Traffic Signal	1 L/T, 1 T/R			1	1 T, 1 T/R		1	2	1	1	1 T, 1 T/R	

The proposed geometry of the local street intersections shown in **Table 7** above for the No Access Scenario are the same as those shown in **Table 5** for the Partial Access Scenario. As noted previously, most, if not all, of the selected local road intersections analyzed have capacity improvements proposed under the Partial Access Scenario that essentially maximize the roadway within the available ROW, mainly due to the developed, urban nature of the study area. As such, despite some changes in demand along these roadways, there are no additional improvements that could likely be implemented at these locations to reasonably accommodate the resulting turning movement volumes. As a result, there is degradation in turning movement LOS at some of these key intersections as part of the No Access Scenario.

Table 8 below shows the design year peak hour operations for the No Access Scenario at key local road intersections.

Table 8: No Access Scenario – Design Year LOS for Local Road Intersections

Intersection	Peak Hour	Level of Service (LOS) by Movement												Overall Int LOS
		Eastbound			Westbound			Northbound			Southbound			
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Bluemound Road and Hawley Road	AM	C	C	B	C		D	C		C	C	C	C	
	PM	C	C	B	B		D	C		B	B	C	B	
Bluemound Road and 68th Street	AM	C	E*		F*		C	E		C	C	B		
	PM	E		D	F*		D	E		D	C		D	
National Avenue and WIS 341 (MPW)	AM	E		D	E	E	D	D	D	A	E	D	B	
	PM	D		C	E		D	E	D	A	D	C	A	
National Avenue and 60th Street (Hawley Road)	AM	C		B	C		B		D		E		C	
	PM	D		B	B		B		B		C		B	
National Avenue and Greenfield Avenue	AM	D		C	C		C		C		B		B	
	PM	E		D	E	E			C		D		C	
Greenfield Avenue and 70th Street	AM		A		B		C	C	C	A	C		B	
	PM		B		B		D	C	B	A	B		C	

* - Volume/capacity ratio is equal to or greater than 1.0

As shown in **Table 8** on the previous page, the majority of intersections analyzed operate at acceptable levels of service (LOS D or better) overall during both design year peak hours under the No Access Scenario. The intersections of National Avenue and Hawley Road, and Greenfield Avenue and 70th Street operate no worse than LOS C overall during either peak hour with the proposed intersection improvements.

However, overall there are slightly more turning movements that operate poorly (LOS E) or fail (LOS F) during either design year peak hour in comparison to the Partial Access Scenario. This is likely due to the traffic demand that no longer can access I-94 via Hawley Road, and therefore must use the parallel local roadways to access adjacent service interchanges. As noted previously, there are no additional improvements that can likely be implemented at intersections with poor or failing movements to improve operations due the constrained and urban nature of the study area.

The intersection of National Avenue and WIS 341 (Miller Park Way) continues to be a critical intersection in terms of access-based diversion operations. As discussed under the preceding scenarios, this intersection is located in a very constrained environment and as a result, ideal capacity-related improvements are unfeasible.

Conclusion

A comparison between all access scenarios of the number of peak hour intersection turning movements at three key intersections that operate at LOS E or LOS F, including overall intersection LOS, is presented for convenience in **Table 9** below.

Table 9: Access Scenarios – Local Intersection Poor and Failing Movements Comparison

Intersection		Access Scenario - Local Intersection Operations					
		Full Access		Partial Access		No Access	
		AM	PM	AM	PM	AM	PM
Bluemound Road and 68th Street	Movements	0-E, 0-F	0-E, 0-F	1-E, 1-F	1-E, 0-F	2-E, 1-F	2-E, 1-F
	Overall	C	C	D	C	D	D
National Avenue and WIS 341 (MPW)	Movements	3-E, 1-F	2-E, 0-F	2-E, 1-F	2-E, 0-F	4-E, 0-F	2-E, 0-F
	Overall	D	D	D	D	D	D
National Avenue and Greenfield Avenue	Movements	0-E, 0-F	0-E, 0-F	0-E, 0-F	2-E, 0-F	1-E, 0-F	0-E, 0-F
	Overall	C	C	C	D	C	C
Totals		3-E, 1-F	2-E, 0-F	3-E, 2-F	5-E, 0-F	7-E, 1-F	4-E, 1-F

As shown in **Table 9** above, the Full Access Scenario has the least number of peak hour turning movements at these three key local intersections that operate at LOS E or LOS F. This is mainly a result of the full access provided at the Hawley Road Interchange, which results in less demand on the local road system. Conversely, the No Access Scenario has the greatest number of peak hour turning movements at the three key local intersections that operate at LOS E or LOS F during the peak hours. As a result, it follows that reducing or eliminating access at the Hawley Road Interchange has a negative impact on local road operations due to the increased demand that is forced to use parallel local roadways and adjacent service interchanges.

6.0 VOLUME IMPACTS ON ADJACENT SERVICE INTERCHANGES

The following sections detail the specific volume impacts to the service interchanges adjacent to Hawley Road, 68th/70th Street, and the Stadium, as part of the diversion related to the various access scenarios. Adjacent service interchange operations for each access scenario are discussed further in [Section 7](#).

Please note that Stadium Interchange system ramp movements referenced within this and subsequent sections utilize a “from-to” naming convention. For example, the I-94 EB to US 41 NB system ramp is recognized as the movement from the west leg of the Stadium Interchange to the north leg of the Stadium Interchange, and would be referred to as the “west-to-north” (W-N) system ramp.

Full Access Scenario

Under the Full Access Scenario, volumes generally increase in the design year, as compared to existing conditions, at the 68th/70th Street, Hawley Road, and Stadium Interchanges. Under this scenario, all three interchanges retain full access and therefore, forecasted design year volumes are a reflection of improved freeway geometry/operations (removal of left-hand ramps, improved horizontal and vertical curvature, additional capacity, etc.) and accessible/reliable parallel local routes. As noted previously, the forecasted volumes associated with the Full Access Scenario do include a consideration of the freeway capacity constraint through the cemetery section, which results in some diversion to the local street network.

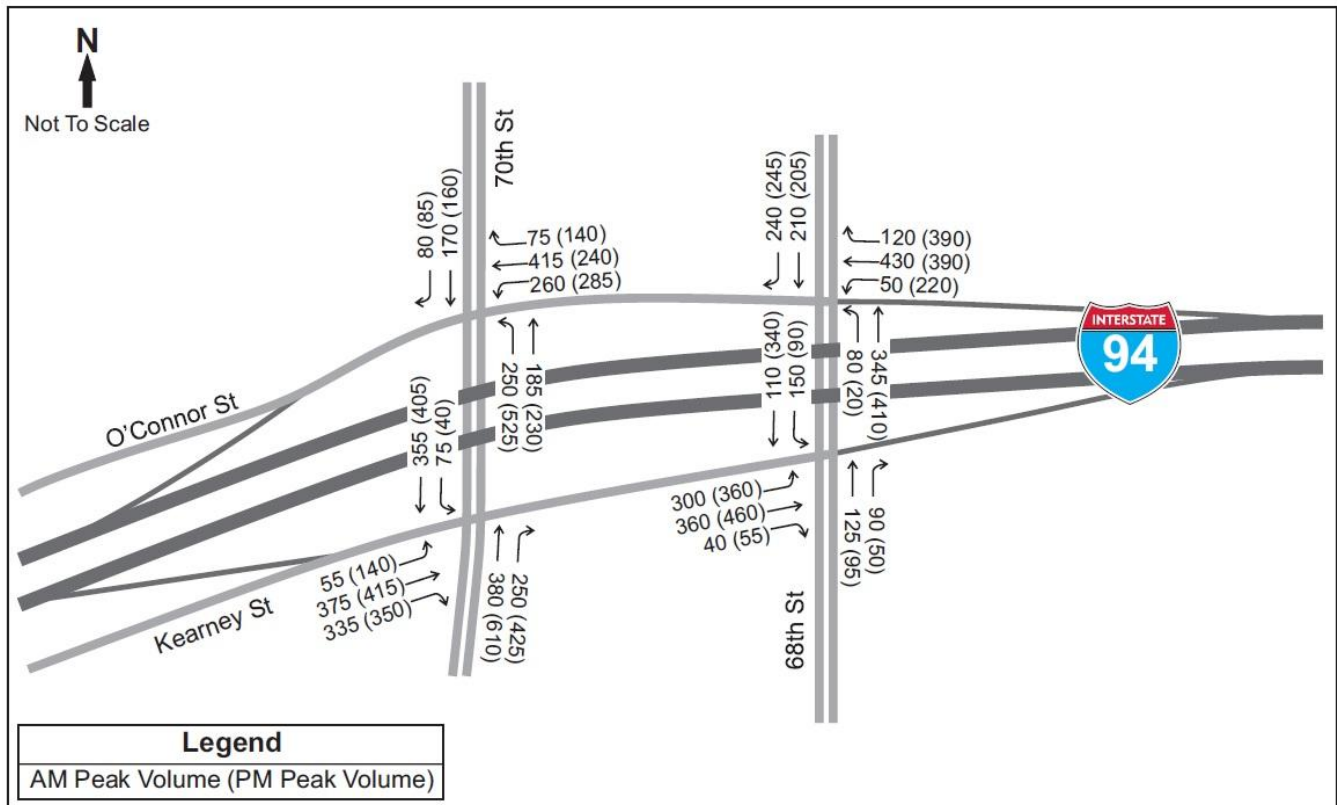
The following sections further detail the volume impacts to each service interchange as part of the Full Access Scenario.

68th/70th Street Interchange

The 68th/70th Street Interchange is located approximately one half mile west of Hawley Road. 68th Street is a two-lane facility that serves as the connecting roadway between the service interchange and Bluemound Road, which runs parallel to I-94 on the north side of the freeway. Similarly, 70th Street is a four-lane facility that connects the interchange to Greenfield Avenue and National Avenue, located south of I-94. All three parallel roadways intersect with Hawley Road at signalized intersections.

Additionally, a percentage of the diversion to the 68th/70th Street Interchange can be attributed to the capacity constraint through the cemetery section, where some traffic avoids this section of freeway and utilizes the parallel local routes as a bypass.

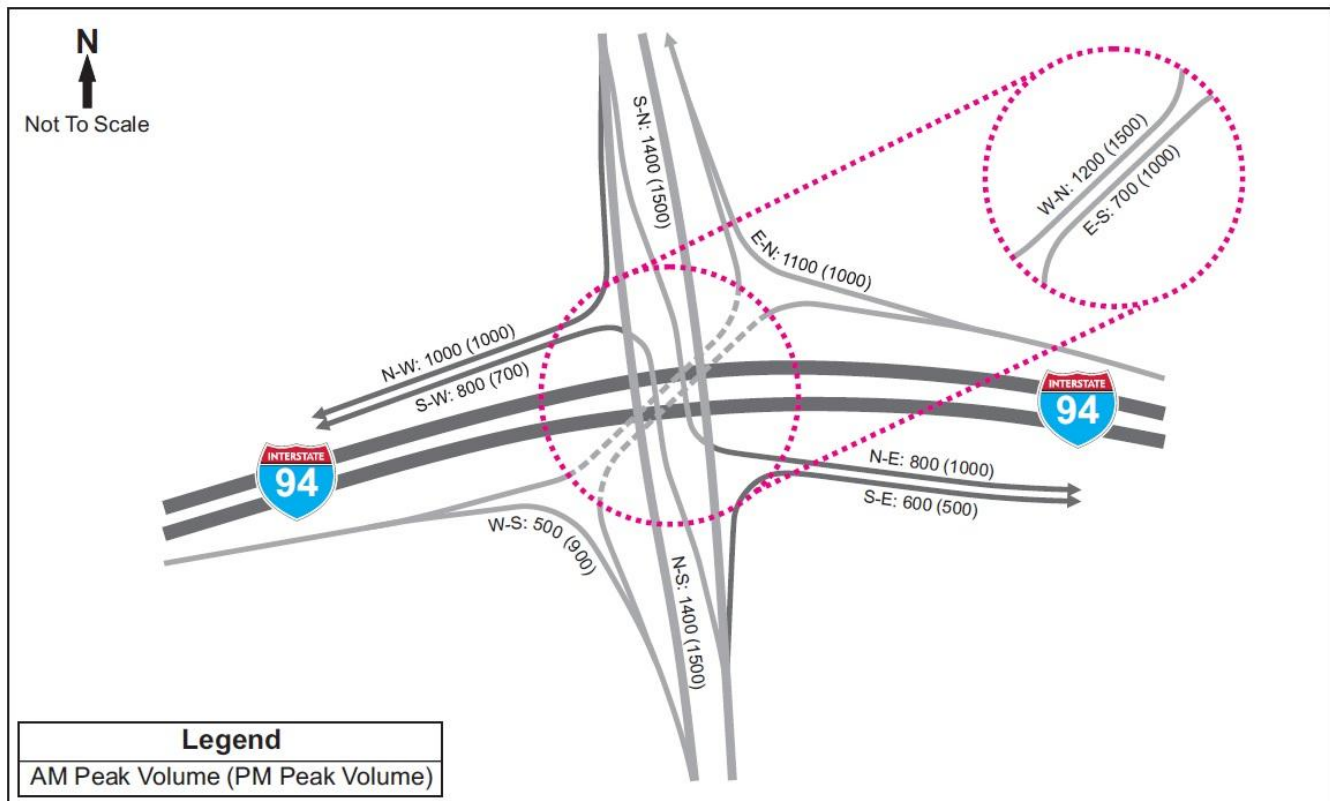
Figure 5 on the following page shows the 2040 peak hour turning movement volumes at the 68th/70th Street Interchange under the Full Access Scenario. As noted previously, the peak hour volumes at this interchange associated with the Full Access Scenario can be considered as a “base” condition of the design year demand.

Figure 5: Full Access Scenario – 68th/70th Street Interchange 2040 Peak Hour Volumes

Stadium Interchange

The Stadium Interchange is a system interchange located approximately one mile east of Hawley Road. The Stadium Interchange serves WIS 341 (Miller Park Way) to the south of I-94 and US 41 to the north. WIS 341 is an eight-lane, signalized corridor that connects I-94 to National Avenue and Greenfield Avenue. US 41 is a six-lane, grade-separated roadway that connects US 41 north to Lisbon Avenue, and provides access to a few, major cross-streets (Wisconsin Avenue, Bluemound Road, State Street).

Figure 6 on the following page shows the 2040 peak hour volumes at the Stadium Interchange under the Full Access Scenario. Again, the peak hour volumes at this interchange associated with the Full Access Scenario can be considered as a “base” condition of the design year demand.

Figure 6: Full Access Scenario – Stadium Interchange 2040 Peak Hour Volumes

Partial Access Scenario

In comparison to the Full Access Scenario, peak hour volumes at the 68th/70th Street Interchange increase slightly, as access to and from the east is removed at Hawley Road. Peak hour volumes at the Stadium Interchange are increased more by comparison to the 68th/70th Street Interchange as part of the Full Access Scenario. The heaviest volume changes are concentrated to the system ramp movements to/from the east and south.

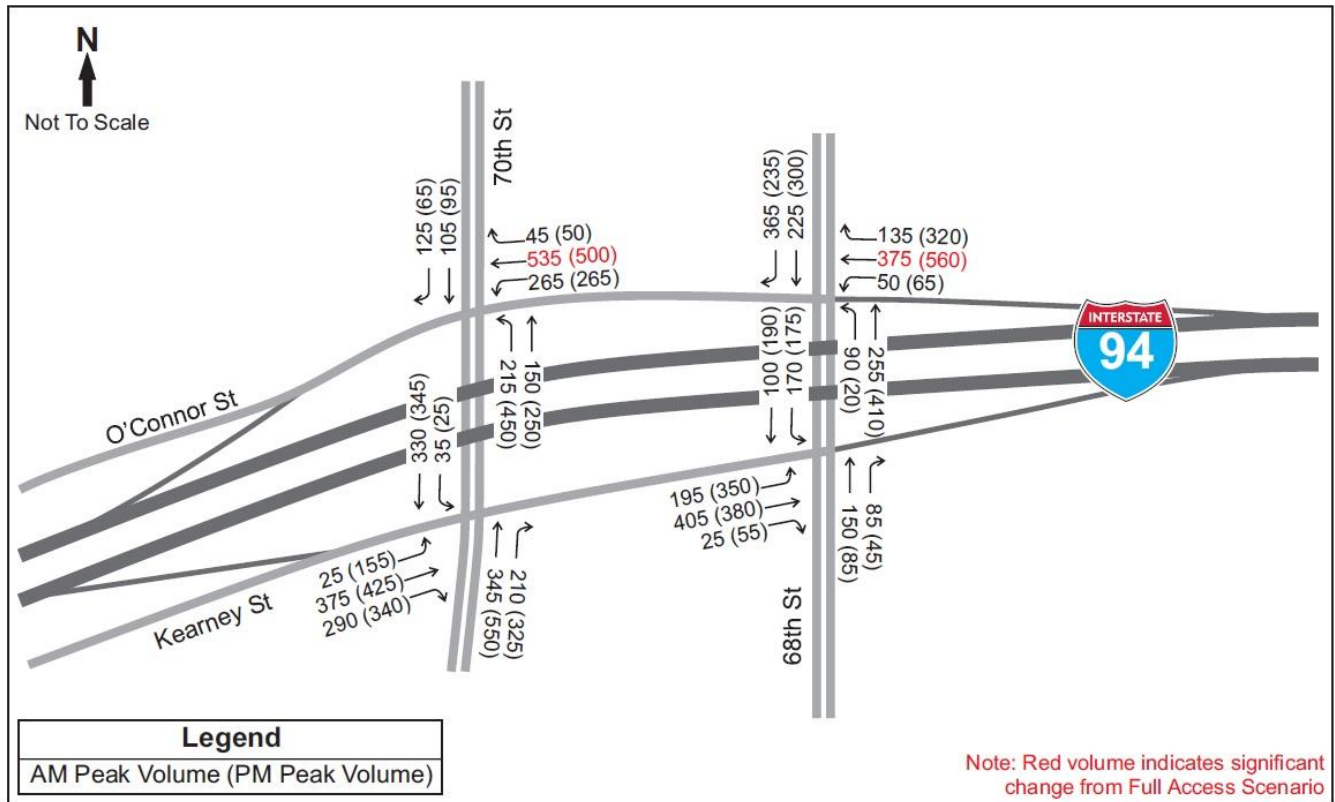
68th/70th Street Interchange

Providing a partial access service interchange at Hawley Road results in a slight volume shift to the related 68th/70th Street service ramps to/from the east (mainly the I-94 WB exit ramp), as traffic is forced to the adjacent interchange for freeway access. As a result, the I-94 WB exit ramp to 68th/70th Street and associated downstream turning movements (westbound through [WBT] at 68th Street, WBT at 70th Street) show slight increases in volume, as that traffic is shifted from the I-94 WB exit ramp to Hawley Road. There is little to no similar increase in traffic volumes of the I-94 EB entrance ramp, as the volumes associated with the Hawley Road EB entrance ramp are mainly shifted to the Stadium Interchange.

Again, it should be noted that there is still some diversion to the 68th/70th Street Interchange that is related to the freeway capacity constraint through the cemetery section.

Figure 7 below shows the design year peak hour turning movement volumes at the 68th/70th Street Interchange under the Partial Access Scenario. Turning movement volumes that are significantly different due to the assumed change in access in comparison to the Full Access Scenario are highlighted in red. Other volume changes not highlighted are considered secondary impacts caused by local traffic adjusting their routes due to the change in freeway-related traffic demand.

Figure 7: Partial Access Scenario – 68th/70th Street Interchange 2040 Peak Hour Volumes

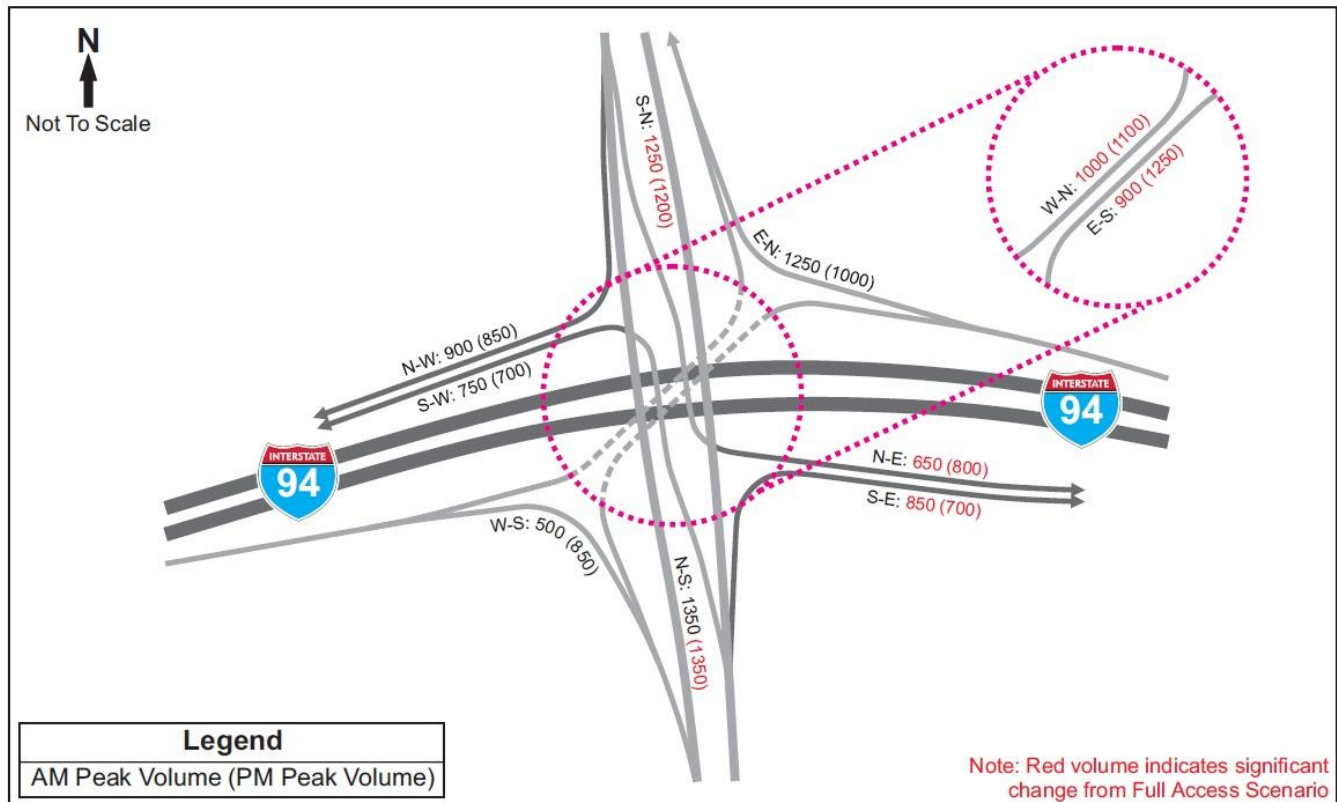


Stadium Interchange

The Partial Access Scenario at the Hawley Road Interchange has a significant impact on the Stadium Interchange in comparison to the Full Access Scenario. This is due to the location of the Stadium Interchange (east) in comparison to Hawley Road and the proposed partial access to/from the west under this scenario. The W-N and north-to-east (N-E) system ramp movements have reduced peak hour volumes during both peak hours in comparison to the Full Access Scenario. The W-N system ramp volume reduction is likely related, at least partially, to the loss of direct freeway access to the east from the Hawley Road Interchange. The increased volumes on the east-to-south (E-S) and south-to-east (S-E) system ramps are also likely related to the access modification at Hawley Road under the Partial Access Scenario, where traffic that would have normally used Hawley Road has shifted to the Stadium Interchange via the parallel local routes to enter and exit the freeway.

Figure 8 below shows the design year peak hour volumes at the Stadium Interchange under the Partial Access Scenario. The red, highlighted volumes designate changes in volume for specific ramps as part of this scenario. All other system ramp movement changes in volume, as compared to the Full Access Scenario, are assumed to be related to secondary impacts of freeway traffic demand adjusting their routes through the corridor due to the change in access at Hawley Road.

Figure 8: Partial Access Scenario – Stadium Interchange 2040 Peak Hour Volumes



No Access Scenario

Under the No Access Scenario at the Hawley Road Interchange, volumes generally increase at the 68th/70th Street and Stadium Interchanges due to a combination of their respective proximities, accessible/reliable parallel local routes, and freeway capacity constraint through the cemetery section. The following sections further detail the volume impacts to each service interchange, due to the removal of freeway access to/from Hawley Road.

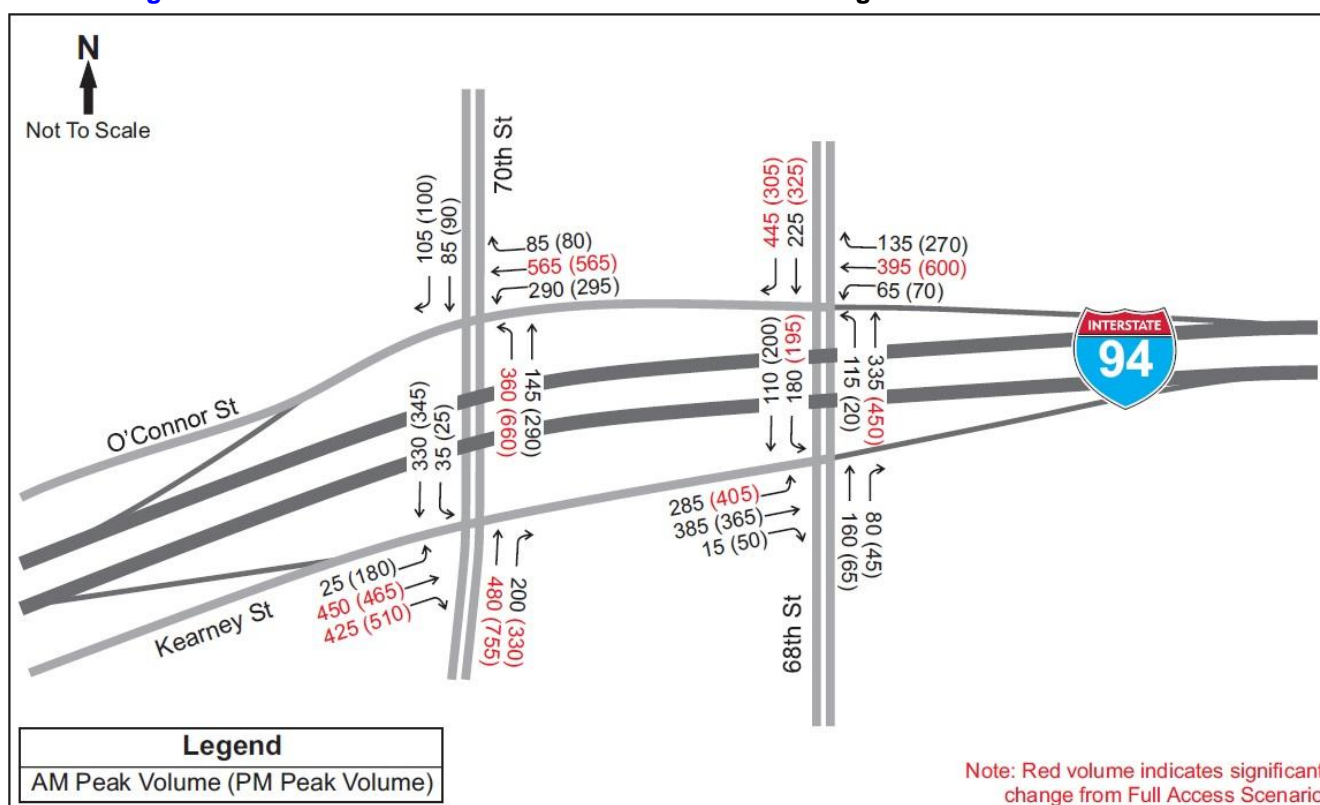
68th/70th Street Interchange

Removal of freeway access to/from the Hawley Road Interchange results in peak hour volume increases to the 68th/70th Street Interchange, specifically the I-94 EB exit and entrance ramps, and I-94 WB entrance ramp, as traffic shifts to the next available interchange. The changes in approach volumes at 68th Street (southbound [SB] approach) and 70th Street (northbound [NB] approach) are related to the diversion volumes on the local street network, as traffic uses the parallel routes to access this interchange.

Additionally, a percentage of the diversion to the 68th/70th Street Interchange can be attributed to the capacity constraint through the cemetery section, where some traffic avoids this section of freeway and utilizes the parallel local routes as a bypass.

Figure 9 below shows the design year peak hour turning movement volumes at the 68th/70th Street Interchange under the No Access Scenario. Turning movement volumes that are significantly different due to the assumed change in access in comparison to the Full Access Scenario are highlighted in red. Other volume changes not highlighted are considered secondary impacts caused by local traffic adjusting their routes due to the change in freeway-related traffic demand.

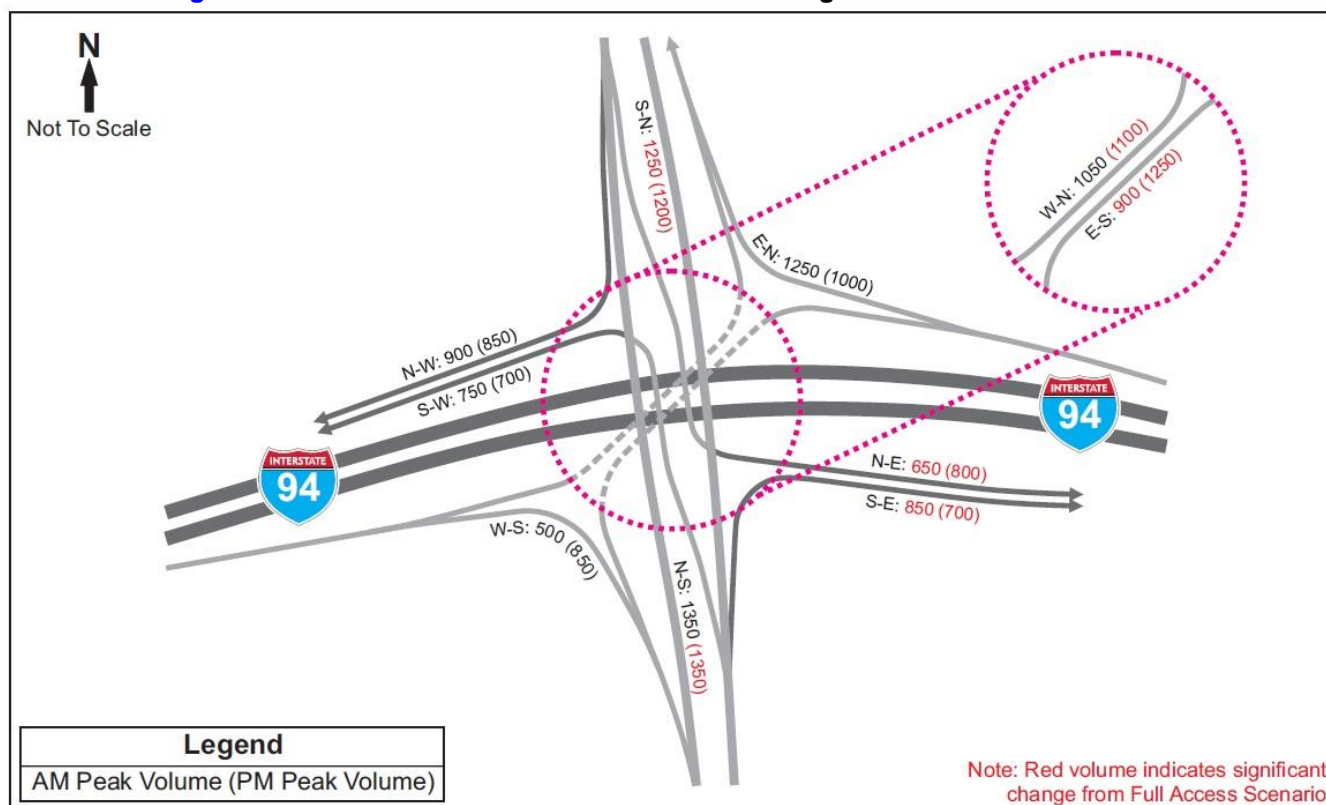
Figure 9: No Access Scenario – 68th/70th Street Interchange 2040 Peak Hour Volumes



Stadium Interchange

The forecasted peak hour volumes for the Stadium Interchange under the No Access Scenario are very similar to those under the Partial Access Scenario. This is mainly due to the location of the Stadium Interchange (east) in comparison to Hawley Road. As such, the removal of the remaining access to and from the west at the Hawley Road Interchange under this scenario has little to no impact on the Stadium Interchange.

Figure 10 on the following page shows the design year peak hour volumes at the Stadium Interchange under the No Access Scenario. The red, highlighted volumes designate changes in volume for specific ramps as part of this scenario. All other system ramp movement changes in volume, as compared to the Full Access Scenario, are assumed to be related to secondary impacts of freeway traffic demand adjusting their routes through the corridor due to the change in access at Hawley Road.

Figure 10: No Access Scenario – Stadium Interchange 2040 Peak Hour Volumes

7.0 FREEWAY AND ADJACENT SERVICE INTERCHANGE OPERATIONS

Freeway Operations

The I-94 mainline from the Stadium Interchange to the 68th/70th Street Interchange was analyzed for each Hawley Road access scenario using the 2010 Highway Capacity Manual (HCM) freeway methodology. The HCM 2010 peak hour LOS for each freeway segment is shown in **Figures 11** (AM Peak) and **12** (PM Peak) on **pages 32 and 33**, with the results summarized for each peak hour in **Table 11** on **page 34**. As noted previously, while the Full Access Scenario was eliminated from consideration due to the scale of its impacts, it is retained in this section for comparative purposes. The following sections discuss the mainline operations across all three scenarios for each design year peak hour.

It should be noted that the 2010 HCM is a static analysis and therefore does not take into account adjacent segment conditions when determining an individual segment's operational characteristics. As a result, the reported average basic segment speeds shown in Table 8 are likely higher than what is operationally feasible due to the presence of ramp and weave segments within each access scenario, which will naturally introduce some turbulence and congestion within the corridor.

Table 10 on the following page shows a comparison of reported average speeds between 2010 HCM methodology and Paramics analysis for the Partial Access and No Access Scenarios. Paramics is a microsimulation software that helps model more complex freeway configurations and driver behaviors. The dynamic nature of this tool allows for a better understanding of the interactions between adjacent freeway segments, especially in congested or slower speed conditions. A comparison of resulting speeds under the Full Access Scenario is not available, as the study team has not created a Paramics model that includes full access at Hawley Road under the 8LAG Alternative at this time.

The average speeds reported from the Partial Access Scenario and No Access Scenario Paramics models have been averaged across all lanes for the entirety of each analysis segment to better correspond with the segmentation of the 2010 HCM analysis.

Table 10: I-94 Mainline Operations – HCM 2010 and Paramics Speed Comparison**Partial Access Scenario**

Location	HCM Segment Type	AM Peak Hour Reported Speed (mph)			PM Peak Hour Reported Speed (mph)		
		HCM 2010	Paramics	Difference	HCM 2010	Paramics	Difference
I-94 Eastbound							
70th St Exit to Lane Drop	Basic	65	53	12	65	56	9
Lane Drop to 68th St Entr Ramp	Basic	63	43	20	61	50	11
68th St Entr Ramp to Hawley Rd Exit Ramp	Weave	52	40	12	51	48	3
Hawley Rd Exit Ramp to Stadium Interchange	Basic	62	45	17	59	47	12
I-94 Westbound							
Stadium Interchange to Hawley Rd Entr Ramp	Basic	62	48	14	61	47	14
Hawley Rd Entr Ramp to 68th St Exit Ramp	Weave	51	51	0	50	50	0
68th St Exit Ramp to Lane Add	Basic	63	49	14	64	46	18
Lane Add to 70th St Entr Ramp	Basic	65	43	22	65	42	23

No Access Scenario

Location	HCM Segment Type	AM Peak Hour Reported Speed (mph)			PM Peak Hour Reported Speed (mph)		
		HCM 2010	Paramics	Difference	HCM 2010	Paramics	Difference
<i>I-94 Eastbound</i>							
70th St Exit to Lane Drop	Basic	65	56	9	65	55	10
Lane Drop to 68th St Entr Ramp	Basic	64	51	13	62	48	14
68th St Entr Ramp	Ramp	54	54	0	53	49	4
68th St Entr Ramp to Stadium Interchange	Basic	62	51	11	59	45	14
<i>I-94 Westbound</i>							
Stadium Interchange to 68th St Exit Ramp	Basic	62	49	13	61	48	13
68th St Exit Ramp	Ramp	51	52	1	51	53	2
68th St Exit Ramp to Lane Add	Basic	64	50	14	64	54	10
Lane Add to 70th St Entr Ramp	Basic	65	50	15	65	51	14

As shown in [Table 10](#) on the previous page, the 2010 HCM and Paramics analysis resulting speeds during the design year peak hours for the ramp and weave segments are fairly close to one another under both access scenarios, with the only exception being the I-94 EB weave during the AM peak hour (Partial Access Scenario). However, where the average speeds of adjacent basic segments under 2010 HCM methodology shows no influence of slower ramp/weave segments, Paramics does show the impact of the more turbulent ramp and weave sections on upstream and downstream basic segments, which is more realistic in comparison to field operations.

AM Peak Hour

In general, all three access scenarios operate similarly on the freeway mainline during the AM peak hour from a pure LOS standpoint. All scenarios operate between LOS C and LOS D between the 68th/70th Street Interchange and the Stadium Interchange, as shown in [Figure 11](#) on the following page.

However, there are some differences between the scenarios when considering average segment speeds during the AM peak hour. As shown in [Table 10 and 11](#), the Partial Access and No Access Scenarios have similar average speeds and profiles in each direction along I-94 under both 2010 HCM and Paramics analyses. The slowest locations are mainline weave between 68th/70th Street and Hawley Road (Partial Access Scenario) and the 68th/70th Street service ramps to/from the east (No Access Scenario).

In comparison, the Full Access Scenario has the worst average resulting speed of all three scenarios during the AM peak hour at approximately 58 mph (2010 HCM), mainly due to a combination of ramp and weave locations that operate slower than the adjacent segments. The resulting increased turbulence due to both segment types in this scenario would likely result in slower speeds in both directions on the west leg, as indicated previously.

PM Peak Hour

Similar to the AM peak hour, there are parallels across all scenarios during the design year PM peak hour in terms of LOS and average speeds. All three scenarios operate between LOS C and LOS E between the 68th/70th Street Interchange and the Stadium Interchange, as shown in [Figure 12](#) on [page 33](#). The LOS E segments occur (roughly) between Hawley Road and the Stadium Interchange, through the cemetery section. As noted previously, this section of I-94 for all 8LAG Alternative access scenarios is over-capacity in the design year and can only provide four, 11-foot wide lanes and less than desirable shoulder widths due to the physical constraints of the cemeteries located on either side of the freeway corridor.

Figure 11: I-94 Mainline Operations Access Scenario Comparison - 2040 AM Peak Hour HCM 2010 Results

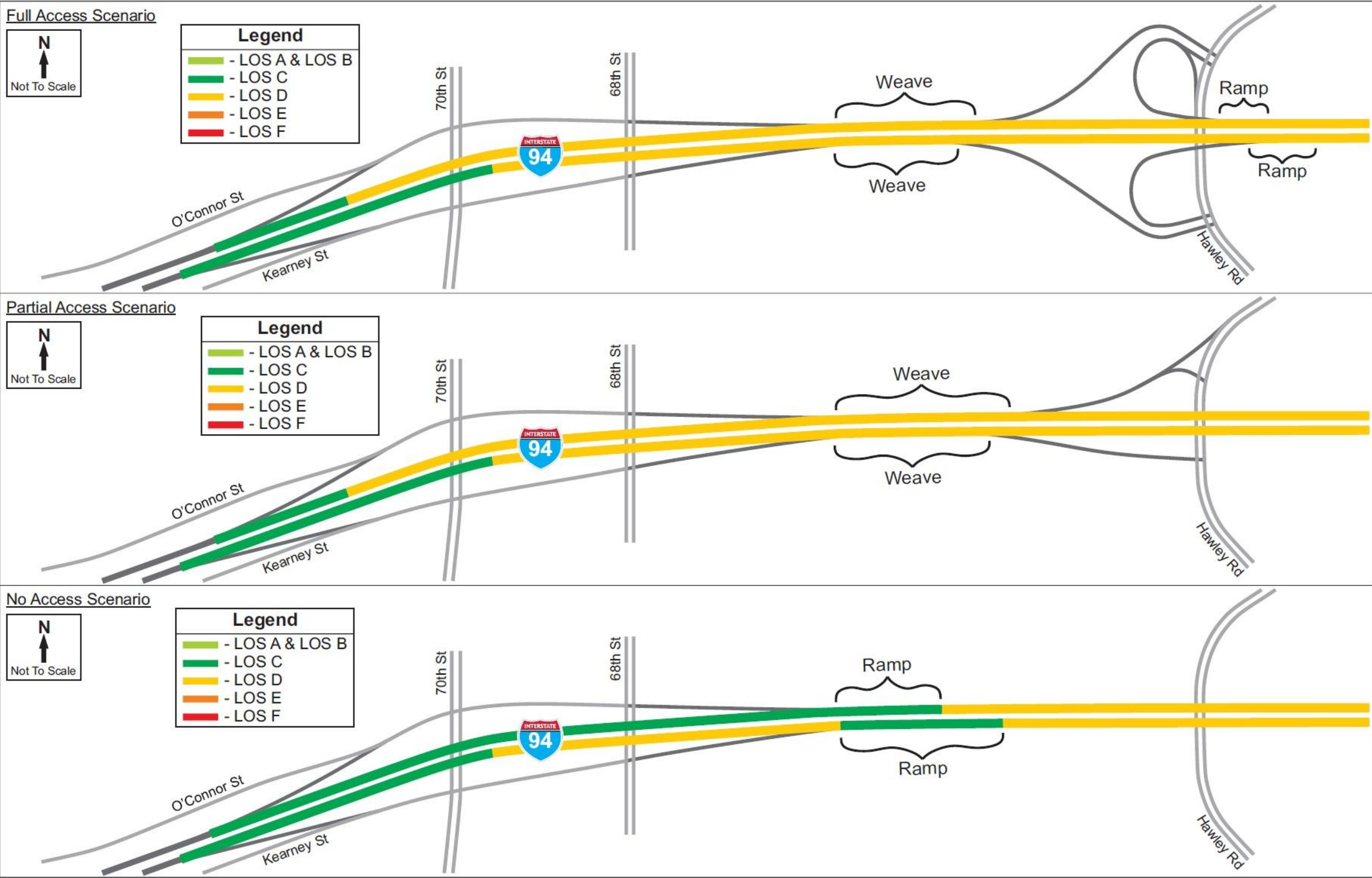


Figure 12: I-94 Mainline Operations Access Scenario Comparison - 2040 PM Peak Hour HCM 2010 Results

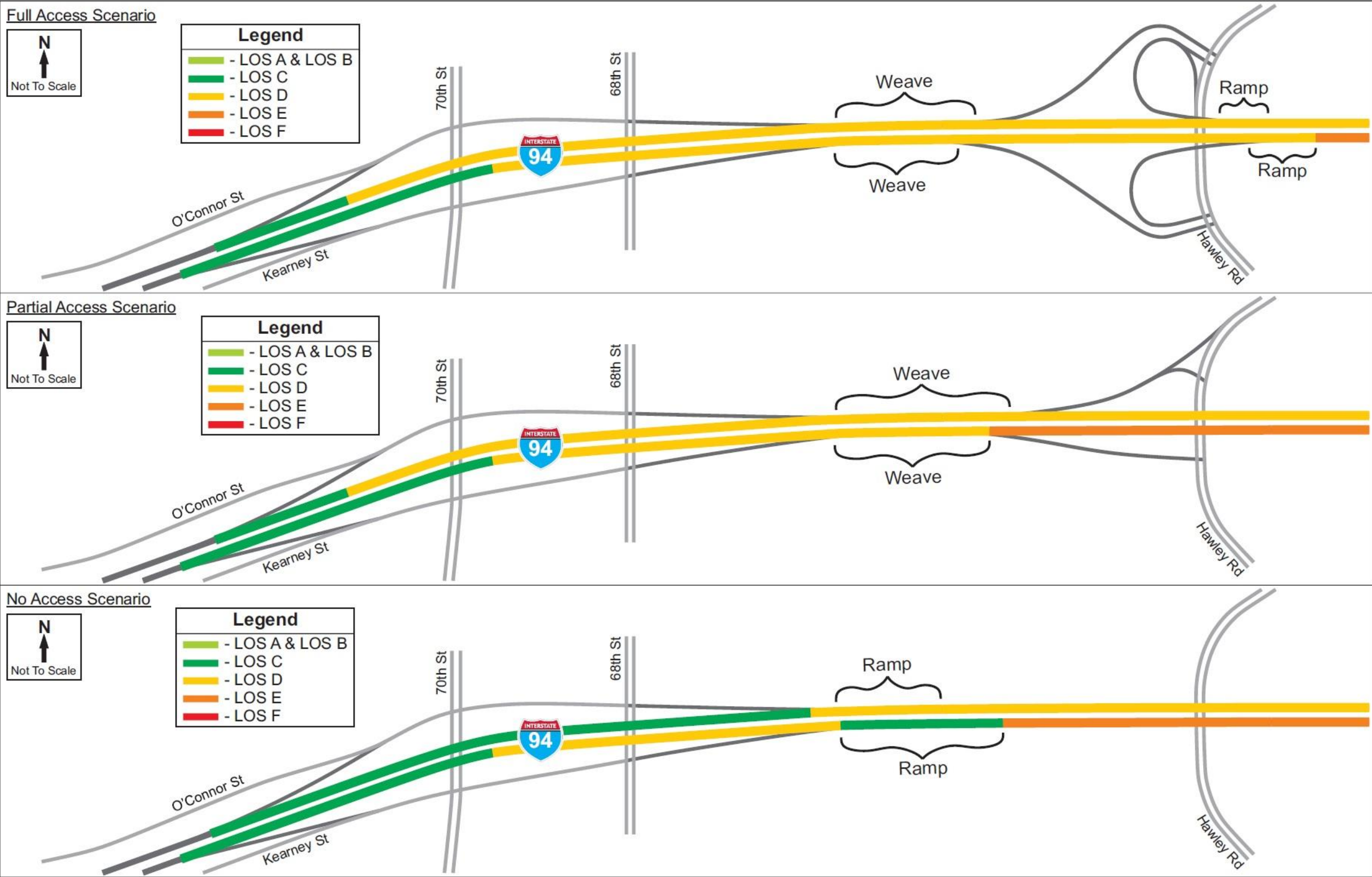


Table 11: I-94 Mainline Operations – HCM 2010 Results Comparison**Full Access Scenario**

Location	HCM Segment Type	Number of Lanes	AM Peak Hour			PM Peak Hour		
			LOS	Density (pc/mi/ln)	Speed (mph)	LOS	Density (pc/mi/ln)	Speed (mph)
I-94 Eastbound								
70th St Exit Ramp to Lane Drop	Basic	5	C	21.4	65	C	24.2	65
Lane Drop to 68th St Entr Ramp	Basic	4	D	27.4	63	D	32.2	61
68th St Entr Ramp to Hawley Rd Exit Ramp	Weave	5	D	29.5	52	D	33.7	50
Hawley Rd Exit Ramp to Hawley Rd Entr Ramp	Basic	4	D	28.5	63	D	32.2	61
Hawley Rd Entr Ramp	Ramp	4	D	30.2	49	D	29.8	49
Hawley Rd Entr Ramp to Stadium Interchange	Basic	4	D	34.3	59	E	36.6	58
I-94 Westbound								
Stadium Interchange to Hawley Rd Exit Ramp	Basic	4	D	31.4	61	D	33.0	60
Hawley Rd Exit Ramp	Ramp	4	D	32.5	49	D	33.5	49
Hawley Rd Exit Ramp to Hawley Rd Entr Ramp	Basic	4	D	30.2	62	D	31.7	61
Hawley Rd Entr Ramp to 68th St Exit Ramp	Weave	5	D	32.9	49	D	34.4	48
68th St Exit Ramp to Lane Add	Basic	4	D	34.1	59	D	28.7	63
Lane Add to 70th St Entr Ramp	Basic	5	C	25.2	64	C	22.2	65

Partial Access Scenario

Location	HCM Segment Type	Number of Lanes	AM Peak Hour			PM Peak Hour		
			LOS	Density (pc/mi/ln)	Speed (mph)	LOS	Density (pc/mi/ln)	Speed (mph)
I-94 Eastbound								
70th St Exit Ramp to Lane Drop	Basic	5	C	20.9	65	C	23.1	65
Lane Drop to 68th St Entr Ramp	Basic	4	D	27.7	63	D	32.2	61
68th St Entr Ramp to Hawley Rd Exit Ramp	Weave	5	D	29.7	52	D	33.7	51
Hawley Rd Exit Ramp to Stadium Interchange	Basic	4	D	30.0	62	E	35.0	59
I-94 Westbound								
Stadium Interchange to Hawley Rd Entr Ramp	Basic	4	D	30.5	62	D	31.1	61
Hawley Rd Entr Ramp to 68th St Exit Ramp	Weave	5	D	30.5	51	D	31.7	50
68th St Exit Ramp to Lane Add	Basic	4	D	28.7	63	D	26.9	64
Lane Add to 70th St Entr Ramp	Basic	5	C	21.2	65	C	20.2	65

No Access Scenario

Location	HCM Segment Type	Number of Lanes	AM Peak Hour			PM Peak Hour		
			LOS	Density (pc/mi/ln)	Speed (mph)	LOS	Density (pc/mi/ln)	Speed (mph)
I-94 Eastbound								
70th St Exit Ramp to Lane Drop	Basic	5	C	20.9	65	C	23.1	65
Lane Drop to 68th St Entr Ramp	Basic	4	D	26.6	64	D	30.4	62
68th St Entr Ramp	Ramp	4	C	24.6	54	C	27.1	53
68th St Entr Ramp to Stadium Interchange	Basic	4	D	30.3	62	E	35.0	59
I-94 Westbound								
Stadium Interchange to 68th St Exit Ramp	Basic	4	D	30.5	62	D	31.1	61
68th St Exit Ramp	Ramp	4	C	27.5	51	D	29.8	51
68th St Exit Ramp to Lane Add	Basic	4	D	27.1	64	C	25.6	64
Lane Add to 70th St Entr Ramp	Basic	5	C	21.2	65	C	20.2	65

The differences between the scenarios in terms of average freeway directional operating speeds and profiles on the west leg, as noted in the “AM Peak Hour” discussion previously, again holds true for the PM peak hour. As indicated in [Tables 10 and 11](#), the Partial Access and No Access Scenarios have similar average freeway directional speeds through the basic and ramp/weave segments under both the 2010 HCM methodology and Paramics analysis. For the No Access Scenario, the LOS E basic segment through the cemetery section would likely result in some additional turbulence and congestion near the I-94 EB entrance ramp from 68th/70th Street under the 2010 HCM analysis, which consequently would degrade the reported LOS.

Again, the Full Access Scenario shows the worst average freeway operating speeds in each direction as compared to the previous two access scenarios (2010 HCM). As noted previously, the presence of both ramp and weave segments has a detrimental effect on the operations of the corridor as a whole.

Adjacent Service Interchange Operations

The 68th/70th Street Interchange and Stadium Interchange ramp terminals were analyzed for each access scenario using Synchro and results reported from the HCM 2010 signalized intersection methodology. The Synchro-reported HCM 2010 peak hour LOS and delay for each movement and ramp terminal as a whole is shown for each access scenario in [Tables 12-14](#) (68th/70th Street Interchange) and [Table 15](#) (Stadium Interchange). Peak hour LOS for the Hawley Road Interchange ramp terminals under the Full Access and Partial Access Scenarios was reported in [Sections 3 and 4](#), respectively. The following sections discuss the ramp terminal operations in further detail.

68th/70th Street Interchange

The proposed ramp terminal geometry of the split-diamond design for the 68th/70th Street Interchange remains relatively unchanged for all access scenarios, with some slight intersection modifications to better accommodate specific movements. The three-phase signalization of all four ramp terminals helps to provide acceptable operations across all scenarios and peak hours.

Under the Full Access Scenario, the 68th/70th Street Interchange operates between LOS B and LOS C overall, with some movements operating at LOS D. The intersection of 70th Street and O'Connor Street operates that worse overall of the four ramp terminals, which serves heavy NB and WB movements. [Table 12](#) on the following page shows the 2040 peak hour operations for the 68th/70th Street Interchange ramp terminals under the Full Access Scenario.

Table 12: Full Access Scenario - Proposed 68th/70th Street Interchange Peak Hour Operations

Ramp Terminal	Peak Hour	Level of Service (LOS) and Delay (sec) by Movement												Overall Int
		Eastbound			Westbound			Northbound			Southbound			
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
68th Street and I-94 WB Exit Ramp (O'Connor Street)	AM	-	-	-	B 11.4	B 13.7		A 6.9	A 7.3	-	-	B 14.0	B 16.3	B 11.8
	PM	-	-	-	B 11.0	B 13.3		A 9.6	B 12.2	-	-	B 17.5	C 20.6	B 13.7
70th Street and O'Connor Street	AM	-	-	-	C 25.5	C 25.0		A 4.1	A 0.3	-	-	C 27.9	C 27.3	B 18.5
	PM	-	-	-	D 39.1	C 34.9		A 4.0	A 0.2	-	-	C 32.3	C 32.1	C 20.4
70th Street and Kearney Street	AM	B 19.4		B 18.8	-	-	-	-	C 20.2	A 0.0	A 7.1		-	B 15.3
	PM	C 26.9		C 25.7	-	-	-	-	C 24.4	A 0.0	A 1.5		-	B 18.7
68th Street and I-94 EB Entr Ramp (Kearney Street)	AM	B 19.7	B 17.3	B 15.5	-	-	-	-	B 17.7		A 8.5	A 3.4	-	B 15.5
	PM	C 20.3	B 17.7	B 15.3	-	-	-	-	B 18.3		A 8.8	A 4.0	-	B 14.5

Operations of the 68th/70th Street Interchange ramp terminals under the Partial Access Scenario would operate no worse than LOS C during both peak hours. Overall operations, and more specifically at the intersection of 70th Street and Kearney Street, slightly degrade in comparison to the Full Access Scenario where some of the previous scenario's traffic demand the Hawley Road Interchange is shifted to the 68th/70th Street Interchange, as freeway access is provided to and from the west with the half interchange. **Table 13** below shows the design year peak hour operations for the 68th/70th Street Interchange ramp terminals under the Partial Access Scenario.

Table 13: Partial Access Scenario - Proposed 68th/70th Street Interchange Peak Hour Operations

Ramp Terminal	Peak Hour	Level of Service (LOS) and Delay (sec) by Movement												Overall Int
		Eastbound			Westbound			Northbound			Southbound			
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
68th Street and I-94 WB Exit Ramp (O'Connor Street)	AM	-	-	-	B 14.4	B 12.6	A 5.5	A 3.3	-	-	B 12.3	B 16.4	B 11.3	
	PM	-	-	-	B 13.7	B 12.2	A 8.4	B 14.5	-	-	B 15.5	B 16.7	B 14.2	
70th Street and O'Connor Street	AM	-	-	-	C 22.6	C 22.0	B 18.4	A 4.8	A 1.0	-	-	C 24.3	C 29.8	B 17.5
	PM	-	-	-	D 35.6	C 34.0	C 29.2	A 3.8	A 0.3	-	-	C 30.4	C 30.9	C 20.3
70th Street and Kearney Street	AM	C 33.3	C 32.2	-	-	-	-	B 11.4	A 0.0	B 17.1	-	C 21.0		
	PM	D 39.5	D 35.2	-	-	-	-	B 17.2	A 0.0	B 13.0	-	C 24.1		
68th Street and I-94 EB Entr Ramp (Kearney Street)	AM	B 18.3	B 18.6	-	-	-	-	B 16.0	A 7.2	A 2.3	-	B 14.8		
	PM	C 20.1	B 17.9	-	-	-	-	B 17.2	A 8.8	A 2.4	-	B 14.9		

As shown in **Table 14** below, all four 68th/70th Street Interchange ramp terminals operate at LOS C or better during both design year peak hours under the No Access Scenario. The intersection of 70th Street and Kearney Street operates the worst overall of the four ramp terminals, which serves not only traffic that would have exited at Hawley Road downstream, but also diversion associated with the capacity constraint through the cemetery section. As a result, the eastbound approach operates at LOS C and LOS D during the peak hours as traffic utilizes the intersection to access 70th Street SB or 68th Street NB via the downstream intersection.

Table 14: No Access Scenario - Proposed 68th/70th Street Interchange Peak Hour Operations

Ramp Terminal	Peak Hour	Level of Service (LOS) and Delay (sec) by Movement												Overall Int
		Eastbound			Westbound			Northbound			Southbound			
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
68th Street and I-94 WB Exit Ramp (O'Connor Street)	AM	-	-	-	B 15.1	B 13.0	A 6.7	B 10.9	-	-	B 11.8	B 16.4	B 13.0	
	PM	-	-	-	B 14.5	B 12.4	A 8.6	B 15.8	-	-	B 15.6	B 17.6	B 15.1	
70th Street and O'Connor Street	AM	-	-	-	C 27.4	C 26.3	C 22.3	A 4.5	A 0.4	-	-	C 30.4	D 37.9	B 19.5
	PM	-	-	-	D 36.0	C 34.1	C 29	A 3.3	A 0.2	-	-	D 38.3	D 48.6	B 19.8
70th Street and Kearney Street	AM	C 34.7	C 33.3	-	-	-	-	B 14.2	A 0.0	B 17.6	-	-	C 22.2	
	PM	D 53.8	D 43.8	-	-	-	-	C 24.2	A 0.0	C 21.6	-	-	C 32.7	
68th Street and I-94 EB Entr Ramp (Kearney Street)	AM	B 19.5	B 17.9	-	-	-	-	B 17.6	A 8.4	A 3.2	-	-	B 15.5	
	PM	C 20.8	B 17.5	-	-	-	-	B 18.0	B 11.2	A 7.9	-	-	B 16.2	

Stadium Interchange

The proposed Stadium Interchange design includes two, signalized ramp terminals with flyover ramps for the system interchange movements from I-94 to US 41 (north) and WIS 341 (south). The ramp terminals service the N-E and south-to-west (S-W) system ramp movements that conflict with the corresponding north-south movements through the interchange. Each ramp terminal operates independently as a two-phase signal, which allows for greater flexibility within the signal timings to accommodate changes in demand.

As shown in **Table 15** on the following page, both Stadium Interchange ramp terminals operate at LOS B during the design year peak hours under the No Access and Partial Access Scenarios. These two scenarios are shown with the same operations as the Stadium Interchange demands at the ramp terminals are unaffected by the access at Hawley Road. The Stadium Interchange ramp terminals operate slightly worse under the Full Access Scenario as there is slightly greater demand at this interchange in comparison to the Partial and No Access Scenarios.

Table 15: Access Scenarios - Proposed Stadium Interchange Peak Hour Operations

Ramp Terminal	Peak Hour	Level of Service (LOS) and Delay (sec) by Scenario					
		No Access & Partial Access			Full Access		
		Through	Turning	Int	Through	Turning	Int
S-N (WIS 341 NB) & N-E	AM	C 26.7	A 9.1	B 15.1	C 27.6	B 11.5	B 17.3
	PM	C 24.7	B 11.2	B 16.6	C 29.0	B 14.8	C 20.5
N-S (US 41 SB) & S-W	AM	C 27.5	B 10.6	B 16.6	C 27.6	B 11.5	B 17.3
	PM	C 28.4	A 9.8	B 16.2	C 30.4	B 10.0	B 16.5

8.0 CONCLUSION

The 8LAG Alternative is restricted through the cemetery section to four mainline lanes in each direction, with less than desirable lane and shoulder widths to fit within the existing ROW available and avoid impacts to the cemeteries on either side of the freeway. As a result, the Hawley Road Interchange has been eliminated (No Access Scenario) from the 8LAG Alternative, due to significant impacts related to ROW and the geometric/physical constraints of the cemetery section.

However, the study team has re-examined all three access scenarios (full, partial, and no) at the Hawley Road Interchange, as the proposed elimination of freeway access under the 8LAG Alternative has received strong opposition from stakeholders, including local governments, adjacent businesses, the VA Medical Center, and others. **Table 16** below shows a comparison of important items for the consideration of each access scenario:

Table 16: Access Scenarios Comparison

Scenario	Characteristics				
	Freeway Access	ROW Impacts	Level of Service	Average Operating Speed (mph) ²	Hawley Rd Int Local/Adj Int Diversion
Full	To/from east and west	50 properties	LOS D-E ¹	N/A	0%
Partial	To/from west only	None	LOS D-E ¹	47	66%
No	None	None	LOS C-E ¹	51	100%

1 – Freeway capacity constraint through the cemetery section results in LOS E for all scenarios

2 – Average speeds reported based on Paramics results

As demonstrated in **Table 16** above, the Full Access Scenario at Hawley Road provides full freeway access, while lessening the demand on adjacent service interchanges and the local street network. However, the full service interchange would not operate as well as the other two scenarios overall and has by far the most significant environmental impacts. In comparison, the No Access Scenario has had little public support, mainly due to the loss in direct freeway access at Hawley Road. However, the removal of the Hawley Road Interchange would possibly free up land for redevelopment. The Partial Access Scenario is similar in terms of impacts and the potential for available land. However, providing freeway access to and from the west only would still force approximately two-thirds of the design year demand at Hawley Road to divert to the local street network and adjacent service interchanges to access I-94.

Additionally, potential driver unfamiliarity with the area and the No and Partial Access Scenarios (since they do not provide full freeway access), can be mitigated by directing travelers to the adjacent freeway access points at 68th/70th Street (one half mile west), Stadium (one mile east), or the 44th/46th Street (“embedded”) via the local parallel arterials through the use of way-finding signage. The parallel arterials are located close enough to I-94 that utilizing these roadways to access I-94 does not significantly inconvenience drivers.

As such, WisDOT and the study team would like to request approval from FHWA to study the Partial Access Scenario at Hawley Road in further detail. Additional investigation of the Partial Access Scenario will allow WisDOT and the project team to explain to the public that all realistic options for Hawley Road under the 8LAG Alternative have been thoroughly analyzed and the associated impacts understood.

It should be noted that while the technical merits of the Partial Access Scenario may not significantly outweigh the potential issues, WisDOT and the study team feel that retaining a partial access interchange at Hawley Road could help to address significant stakeholder concerns regarding the loss of access at the Hawley Road Interchange under the 8LAG Alternative. At the very least, the Partial Access Scenario could represent a possible compromise for all parties involved that satisfies a degree of stakeholder mobility and access concerns, while still avoiding impacts through the cemetery section and lessening the operational impacts to adjacent interchanges and the local street system to the greatest extent possible under the 8LAG design.

DRAFT

APPENDIX A: HAWLEY ROAD INTERCHANGE: ACCESS SCENARIO DESIGNS

APPENDIX B: LOCAL ROAD INTERSECTION ANALYSIS LOCATIONS

